

APPENDIX F: Soils

F-1: Planned Mitigation Programs for Soil Erosion

F-2: Pipeline Soil and Permafrost Data

This page intentionally left blank.

Appendix F-1

Planned Mitigation Programs for Soil Erosion

1. Introduction

A variety of plans pertaining to soil resource management and erosion have been developed by Donlin Gold or would be developed during final design. This appendix describes planning documents, instituted programs, and associated permitting requirements that either comprehensively or partially address soil impacts through design features and Best Management Practices (BMPs). These are considered part of the proposed project and are assumed to be in place in the analysis of effects in Section 3.2, Soils. The plans and programs described below would generally apply to all alternatives unless stated otherwise. Additional details regarding soil and erosion construction practices are described in Chapter 2 (Alternatives, Section 2.3.2.3), and specific mitigation measures that apply to soil disturbance, permafrost, and erosion are included in Sections 3.2.3.2.1 through 3.2.3.2.3, respectively.

1.1 Mine Site and Transportation Facilities

ADEC – Stormwater: A Stormwater Pollution Prevention Plan (SWPPP) would be prepared by Donlin Gold, and discharge permit obtained from ADEC prior to constructions as required by the APDES program. The SWPPP would address erosion control features, reclamation, and mitigation measures to control erosion and stormwater runoff during and after construction, and throughout mine site and transportation facilities (mine access road, Angyaruuaq [Jungjuk] Port) operation and closure. The prepared plan would be consistent with a SWPPP format described in the Alaska Construction General Permit (ACGP) Part 5 and the BMPs format in Part 4 of the ACGP.

Plan of Operations: A Plan of Operations would be made available for courtesy review by regulatory agencies. The plan would provide an overview of planned erosion and sedimentation control features in response to specific regulatory permit and planning requirements. Control features in the current Donlin Gold Plan of Operations and associated documents (SRK 2012a, c, d) include, but are not limited to:

- Overburden stockpile management of stormwater runoff using perimeter berms and settling ponds;
- Diversion dams and channels to minimize runoff and erosion surrounding the Tailings Storage Facility (TSF);
- Rock drains, contact water ponds, and controlled runoff and erosion at the Waste Rock Facility (WRF);
- Open pit perimeter interceptor ditches, gravity sumps, haul road ditches, bench dewatering wells, and horizontal drains to control runoff, mass wasting, and erosion in the pit interior;
- Plant site runoff catchment and diversion to the TSF; and
- Culverts to control runoff and erosion at mine access road drainage crossings.

ADNR Land Use Permits and Leases, ROWs, Easements, and BLM Surface Estate Leases: These generally govern areas of ground disturbance permitted under the project.

ADNR Reclamation Plan Approval: No mining activities would commence until ADNR approves a reclamation plan for the project. A draft Reclamation and Closure Plan (RCP) has been

developed by Donlin Gold for purposes of providing guidelines for implementing soil stabilization and reclamation procedures for mining, processing, and ancillary facilities (SRK 2012b). The plan is designed to be compatible with post-mining land uses which include wildlife habitat and recreation, but does not alleviate compliance with other agencies (e.g., ADF&G, ADEC, etc.). The plan also addresses concurrent reclamation activities throughout mine site operation. Plan revisions would be made as necessary to accommodate changes in design, construction, operations, and ongoing stabilization and reclamation measures based on monitoring research and evaluation, and/or utilization of new reasonable and practical reclamation techniques as they are developed. Objectives of the RCP include provisions for protecting surface soils from hydraulic and wind erosion through slope contouring and leveling for soil stabilization and seedbed suitability, and establishment of vegetative communities.

Donlin Gold Monitoring Plan: Programmatic soil monitoring activities are described in the Monitoring Plan component of Donlin Gold's Integrated Waste Management Plan (IWMD) (SRK 2012a) in conjunction with compliance monitoring for surface water, groundwater, and process water media. These include:

- Characterization of overburden over the active mine life for segregation and material management purposes; and
- Operations and post-closure erosional stability compliance inspections associated with designated waste management storage systems and post-mine infrastructure (WRF, TSF, solid waste landfill trenches, and pits).

The Monitoring Plan includes schedules for monitoring frequency and submission of monitoring reports. Continued use and refinement of the plan would proceed throughout construction, operations, closure, and post-closure phases of the project.

1.2 Natural Gas Pipeline

The following planning and regulation mandated documents specific to the proposed pipeline address potential soil impacts, BMPs, and associated mitigation and response measures that are considered part of the proposed project under Alternative 2. Although these plans each serve a unique purpose, some overlap in subject matter where interdependent relationships exist between soil disturbances, permafrost, and erosion.

Stormwater Pollution Prevention Plan (SWPPP): A pipeline-specific SWPPP would be prepared prior to construction as required by APDES permitting (the Multi-Sector General Permit or MSGP). The plan would address erosion control measures, reclamation, and mitigation measures to control erosion and storm water runoff during and after construction.

Erosion and Sedimentation Control Plan (ESC Plan): A preliminary ESC Plan exclusive to the pipeline portion of the proposed Donlin Gold Project (SRK 2013a) has been modeled after the 2011 Alaska Construction General Permit (ACGP) issued by the ADEC under the APDES program. Future modifications to the preliminary ESC Plan (final plan) would directly apply towards a Statewide Pipeline GP (approach) consistent with the ACGP. Elements of the plan are to prevent and control erosion and sedimentation which could otherwise impact water quality and the environment. The plan defines applied erosion control measures and procedures, inspection, evaluation, and reporting. The plan is based on current construction and engineering designs, and would be modified as needed to accommodate future changes in ACGP regulatory requirements or design requirements. This would also include any State Pipeline General Permit developments addressing inadvertent point source contingency

discharge of HDD drilling fluids. Discharge authorizations would include HDD crossing evaluation for fish habitat, water quality, hydraulic data for mixing zone evaluation, and drilling fluids. Measures and BMPs detailed in the ESC Plan are generally associated with immediate or concurrent stabilization and rehabilitation activities. Specific ESC measures pertinent to soil disturbance, permafrost, and erosion are summarized in Sections 3.2.3.2.1 through 3.2.3.2.3 under "Pipeline".

Stabilization, Rehabilitation and Reclamation (SRR) Plan: An SRR plan would be developed for the pipeline during final design clarifying regulatory approved requirements for all disturbed areas (soil and vegetation) throughout the life of the proposed pipeline project (SRK 2013a). Similarities exist between the SRR Plan and the ESC Plan; however, the ESC Plan primarily addresses temporary stabilization goals associated with pipeline construction. Disturbed pipeline areas addressed by the SRR Plan include the ROW, airstrips, material sites, camps, barge landing sites, pipe storage yards, temporary use areas, and maintenance sites. The plan would address final stabilization, rehabilitation, and reclamation at termination, as well as unique conditions related to thaw unstable permafrost, areas susceptible to erosion, and stream bank and streambed restoration. Conditions addressed in the plan related to soils would include removal and replacement, cleanup, stockpiling and use of salvageable growth medium, disposal of excess spoil and excavated material, ESC measures, revegetation, and invasive species prevention and management. A Non-Native Invasive Plants Prevention Plan would be included as part of the SRR Plan, which is addressed in Section 3.10, Vegetation.

ROW access to facilitate prescribed actions would be addressed in the SRR Plan. A description of activities expected during operations would include both routine maintenance and emergency reclamation situations, and a schedule for inspections and maintenance. The SRR Plan would identify the status of temporary use areas following construction, termination and final reclamation actions, and an estimated cost and unconditional guaranty for performance. The unconditional guaranty provided by Donlin to the BLM and ADNR would include a financial guaranty or surety bond as required for performance of approved duties and obligations in a form approved by BLM and ADNR. The SRR Plan would be revised at closure to comply with applicable regulations at the time of termination, and to incorporate BMPs and ESC/ restoration measures based on review of prior practices.

Common Elements of SWPPP, ESC and SRR Plans: These plans would address both temporary and permanent measures for drainage and erosion control, clean-up, and reclamation along the ROW and off-ROW facilities (temporary or permanent). ESC measures in the plans would consider climate and seasonal impacts, extent and duration of surface disturbance, and grading requirements; pre-existing soil conditions such as texture, thermal regime, and drainage patterns; and future land use by the public and wildlife. ESC structures and methods would be designed with the purpose of minimizing erosion from hydraulic (water) processes, permafrost degradation by thermal erosion, and siltation of waterbodies and water quality disturbances. The plans would comply with applicable requirements of the Federal Pipeline ROW Grant, the State Pipeline ROW Lease, and any other applicable landowner authorizations or agreements.

Donlin Gold Permits and Environmental Compliance Program: This program would be prepared to facilitate project compliance with approved permits by Donlin Gold personnel and contractors during all phases of the project (SRK 2013a). The program would provide procedures for regulatory compliance, including the requirements of the ROW authorizations. The program would also detail reporting and monitoring requirements for temporary and permanent

drainage/erosion control measures and BMPs along the pipeline ROW and ancillary facilities/sites.

Operations and Maintenance (O&M) Plan/Manual: An O&M Plan/Manual would be prepared in accordance with federal Pipeline and Hazardous Materials Safety Administration (PHMSA) requirements under 49 CFR 192.605. The plan would provide procedures for operations and maintenance activities, and include a ROW maintenance schedule. Any new or expanded roads or airstrips would be limited to unforeseen circumstances for operation and maintenance. A pipeline inspection, surveillance, and monitoring program would be developed to observe surface conditions on and adjacent to the 50-foot permanent ROW (or 51 feet, 2 inches on BLM-managed lands). Inspections would be performed twice a year, and at intervals not exceeding 9 months. Additional inspections would be warranted due to major storm or seismic events. Documented observations associated with soil conditions and impacts would include stream bank erosion, migration, and scour; slope movements; thaw settlement or frost heave, including ground temperature observations from thermistor string networks; and an assessment of reclamation problems and potential remedial actions.

APPENDIX F-2

Pipeline Soils and Permafrost Data

This page intentionally left blank.

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
0	1.7	Alluvial terrace/reworked moraine	Flat	GP-001-PC, GP-002-PC	0.3	0.3	OL over Silt and Silty Sand	no	>7.7
1.7	2.4	Floodplain, abandoned, bog	Flat	GP-003-PC	4	4	Peat	no	4.3
2.4	2.9	Alluvial terrace/reworked moraine	Flat	GP-004-PC	0	0	Sandy Silt	no	3.8
2.9	3.6	Floodplain, abandoned, bog	Flat	GP-005-PC	6	0	Sand w gravel (road fill) over peat	no	1.8
3.6	5.2	Till/outwash plain, reworked	Flat	GP-006-PC, GP-007-PC, GP-008-PC, GP-009-PC	0	0.4	Silt and Gravelly Sand	no	6
5.2	5.3	Alluvial terrace/reworked moraine	Flat		0	0.5	Sand w Silt	no	6
5.3	5.4	Alluvium, active channel	Flat		0	0	Sand and Gravel	no	0
5.4	5.5	Alluvial terrace/reworked moraine	Flat	GP-010-PC	0	0.5	Sand w Silt	no	6.4
5.5	7.26	Till/outwash plain, reworked	Flat to hilly	GP-011-PC, GP-012-PC, GP-013-PC, GP-014-PC	0	0.2	Silt and Sand w Gravel	no	6.2
7.26	7.36	Till/outwash plain, reworked, bog	Flat to hilly	GP-07; GP-08, GP-09	4.5	0.5	Peat over V SandySilt w Gravel	no	7
7.36	7.49	Till/outwash plain, reworked, bog	Rolling to Hilly	GP-10	2.5	0.5	Peat over V SandySilt w Gravel	no	5
7.49	7.63	Till/outwash plain, reworked	Rolling to Hilly	GP-11; GP-12	1	0.5	V Sandy Silt w Gravel	no	5
7.63	7.83	Till/outwash plain, reworked, bog	Rolling to Hilly	GP-13	2.5	0.5	Peat over V SandySilt w Gravel	no	5
7.83	8.72	Till/outwash plain, reworked, upland	Rolling	GP-14, GP-15	1	1	Silty Sand/Sandy Silt w Gravel	no	10
8.72	9.94	Old terraces, reworked outwash, localized bogs	Hilly to hummocky	GP-16, GP-17	2.5	1	Silty Sand w Gravel	no	3.5
9.94	10.22	Old terraces, reworked outwash, localized bogs	Hilly		0.5	0.5	Silty Sand w Gravel to Silty Gravel w Sand	no	10
10.22	10.23	Abandoned channel, reworked outwash, boggy	Flat to rolling		1	1	Peat/Sandy Silt to Silty Sand w Gravel	no	7
10.23	10.26	Peat bog, reworked outwash	Flat		7	2	Peat/OL	no	2
10.26	10.31	Abandoned channel, reworked outwash, boggy	Flat to rolling	GP-18	2	1	Peat/Sandy Silt to Silty Sand w Gravel	no	7
10.31	10.54	Old terraces, reworked outwash, localized bogs	Hilly		0.5	0.5	Silty Sand w Gravel to Silty Gravel w Sand	no	10
10.54	11.81	Till/outwash plain, reworked, upland	Rolling to Hilly	GP-19, GP-20	1	0.5	Silty Sand w Gravel to Silty Gravel w Sand	no	15
11.81	11.86	Peat bog/reworked till	Flat		7	2	Peat/OL	no	1
11.86	11.89	Till/outwash plain, reworked, upland	Rolling to Hilly		1	0.5	Silty Sand w Gravel to Silty Gravel w Sand	no	15

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
11.89	11.97	Peat bog/reworked till	Flat		7	2	Peat/OL	no	1
11.97	12.6	Till/outwash plain, reworked, upland	Rolling to Hilly		1	0.5	Silty Sand w Gravel to Silty Gravel w Sand	no	15
12.6	12.84	Till/outwash plain, reworked, upland	Rolling to Hilly		0.5	0.5	Silty Sand w Gravel to Silty Gravel w Sand	no	>4
12.84	12.85	Peat bog/reworked till	Flat		7	2	Peat/OL	no	1
12.85	13.01	Reworked till, boggy	Rolling to Hilly		2	1	Peat/Silty Sand w Gravel to Silty Gravel w Sand	no	4
13.01	13.02	Peat bog/reworked till	Flat		7	2	Peat/OL	no	1
13.02	13.09	Reworked till, boggy	Rolling to Hilly		2	1	Peat/Silty Sand w Gravel to Silty Gravel w Sand	no	4
13.09	13.2	Till/outwash plain, reworked, upland	Rolling to Hilly		0.5	0.5	Silty Sand w Gravel to Silty Gravel w Sand	no	>4
13.2	13.27	Mountain colluvium/residual soil	Hilly	GP-21	0.5	0.5	Residual Soil (SM) over Wx bedrock	no	>4
13.27	13.41	Till/outwash plain, reworked, upland	Rolling to Hilly		0.5	0.5	Silty Sand w Gravel to Silty Gravel w Sand	no	>4
13.41	13.48	Peat bog/reworked till	Flat		7	2	Peat/OL	no	1
13.48	13.49	Till/outwash plain, reworked, upland	Rolling to Hilly		0.5	0.5	Silty Sand w Gravel to Silty Gravel w Sand	no	>4
13.49	13.5	Peat bog/reworked till	Flat		7	2	Peat/OL	no	1
13.5	13.55	Till/outwash plain, reworked, upland	Rolling		0.5	0.5	Silty Sand w Gravel to Silty Gravel w Sand	no	>4
13.55	13.56	Reworked till, boggy	Rolling to Hilly		2	1	Peat/Silty Sand w Gravel to Silty Gravel w Sand	no	4
13.56	13.78	Mountain colluvium/residual soil	Hilly		0.5	0.5	Residual Soil (SM) over Wx bedrock	no	>4
13.78	13.79	Reworked till, boggy	Rolling to Hilly		2	1	Peat/Silty Sand w Gravel to Silty Gravel w Sand	no	4
13.79	13.82	Mountain colluvium/residual soil	Hilly		0.5	0.5	Residual Soil (SM) over Wx bedrock	no	>4
13.82	13.89	Reworked till, boggy	Rolling to Hilly		2	1	Peat/Silty Sand w Gravel to Silty Gravel w Sand	no	4
13.89	14	Mountain colluvium/residual soil	Hilly		0.5	0.5	Residual Soil (SM) over Wx bedrock	no	>4
14	14.02	Reworked till, boggy	Rolling to Hilly		2	1	Peat/Silty Sand w Gravel to Silty Gravel w Sand	no	4
14.02	14.06	Mountain colluvium/residual soil	Hilly		0.5	0.5	Residual Soil (SM) over Wx bedrock	no	>4
14.06	14.07	Reworked till, boggy	Rolling to Hilly		2	1	Peat/Silty Sand w Gravel to Silty Gravel w Sand	no	4
14.07	14.11	Mountain colluvium/residual soil	Hilly		0.5	0.5	Residual Soil (SM) over Wx bedrock	no	>4

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
14.11	14.12	Reworked till, boggy	Rolling to Hilly		2	1	Peat/Silty Sand w Gravel to Silty Gravel w Sand	no	4
14.12	14.16	Mountain colluvium/residual soil	Hilly		0.5	0.5	Residual Soil (SM) over Wx bedrock	no	>4
14.16	14.16	Reworked till, boggy	Rolling to Hilly		2	1	Peat/Silty Sand w Gravel to Silty Gravel w Sand	no	4
14.17	14.25	Mountain colluvium/residual soil	Hilly		0.5	0.5	Residual Soil (SM) over Wx bedrock	no	>4
14.25	14.37	Colluvium-alluvium/reworked moraine deposits	Rolling		2	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
14.37	14.81	Till, reworked, upland	Rolling	GP-22	0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
14.81	14.82	Till, reworked, upland, bog	Flat to rolling		2	1	Peat/Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
14.82	14.93	Till, reworked, upland	Rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
14.93	14.95	Till, reworked, upland, bog	Flat to rolling		2	1	Peat/Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
14.95	15.27	Till, reworked, upland	Rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
15.27	15.35	Colluvium-alluvium/reworked till deposits	Rolling		2	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
15.35	16.9	Till, reworked, upland, bog	Rolling	GP-23	2	1	Peat/Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
16.9	16.96	Colluvium-alluvium/reworked till deposits	Rolling		2	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
16.96	19.11	Till, reworked, upland, bog	Rolling	GP-24	2	1	Peat/Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
19.11	19.23	Colluvium-alluvium/reworked till deposits	Rolling to Hilly		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>7
19.23	21.93	Till, reworked, upland, bog	Rolling	GP-25; GP-26; GP-27; GP-28	2.5	1	Peat/Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
21.93	22.73	Till plain/ground moraine, reworked, bog	Rolling		2.5	0.5	Peat/Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
22.73	22.76	Bog, reworked till	Flat	GP-29	8	1	Peat/OL	no	1
22.76	22.98	Till plain/ground moraine, reworked, bog	Rolling		2.5	0.5	Peat/Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
22.98	24.65	Till plain/ground moraine, reworked, bog	Rolling	GP-30; GP-31	2	1	Peat/Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
24.65	25.41	Till plain/ground moraine, reworked, bog	Flat to rolling		2.5	0.5	Peat/Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
25.41	25.45	Bog, reworked till	Flat	GP-32	17	0.5	Peat/OL	no	0.5
25.45	25.78	Till plain/ground moraine, reworked, bog	Flat to rolling		2.5	0.5	Peat/Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
25.78	25.86	Till plain/ground moraine, reworked, bog	Flat to rolling		3	1	Peat over Silty Gravel/Gravelly Silt	no	3
25.86	25.99	Colluvium-alluvium/reworked till deposits	Flat to rolling		1	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
25.99	26.52	Till plain/ground moraine, reworked, bog	Flat to rolling	GP-33;	2.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	5
26.52	26.57	Alluvium/reworked till	Flat to rolling		1	0.5	Poorly Graded Sand and Gravel w Silt	no	10
26.57	27.77	Till plain/ground moraine, reworked, bog	Flat to rolling	GP-34	3	1	Peat over Silty Gravel/Gravelly Silt	no	3
27.77	28.73	Till/outwash plain, reworked, bog	Rolling	GP-35	2.5	0.5	Peat over Sandy Silt w Gravel	no	9
28.73	28.86	Till/outwash plain, reworked, upland terrace, boggy	Flat to rolling	GP-36	3.5	0.5	Peat over Sandy Silt to Silty Sand w Gravel	no	5
28.86	29.62	Till/outwash plain, reworked, bog	Flat to rolling	GP-37	4	0.5	Soft silt over Silty Sand w Gravel	no	2
29.62	29.8	Alluvium/reworked till, boggy	Hummocky		3	0.5	Peat over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
29.8	30.93	Till/outwash plain, reworked, bog	Hummocky	GP-38; GP-39	3	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	5
30.93	31	Alluvium/reworked till, boggy	Hummocky		3	0.5	Peat over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
31	31.36	Till/outwash plain, reworked, bog	Hummocky		3	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	5
31.36	31.45	Alluvium/reworked till	Flat to rolling	GP-40	1	0.5	Poorly Graded Sand and Gravel w Silt	no	4
31.45	32.27	Till/outwash plain, reworked, bog	Hummocky		3	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	5
32.27	32.32	Reworked outwash fan, till, boggy	Rolling	GP-41	2	0.5	Silt over Poorly Graded Sand w Silt	no	5
32.32	33.26	Reworked outwash fan, till	Rolling		0.5	0.5	Silt over Poorly Graded Sand w Silt	no	14
33.26	36.68	Colluvium/reworked moraine deposits, boggy	Rolling to Hilly	GP-42; GP-43; GP-44	2.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>4
36.68	36.91	alluvium, reworked till	Hummocky	GP-45	1	1	Poorly Graded Sand and Gravel w Silt	no	2

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
36.91	38.72	Colluvium/reworked moraine deposits, boggy	Rolling to Hilly	GP-46; GP-47	2.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>4
38.72	39.11	Colluvium/alluvial fan, reworked till, boggy	Rolling	GP-48	3.5	0.5	Sandy Silt to Silty Sand	no	16
39.11	39.96	Colluvium/reworked moraine deposits, boggy	Flat to rolling	GP-49	1	0.5	Sandy Silt to Silty Sand tr Gravel	no	5.5
39.96	40.02	Alluvium/colluvium/reworked moraine deposits, boggy	Rolling to Hilly		3.5	1	Peat over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
40.02	41.15	Colluvium/reworked moraine deposits, boggy	Flat to rolling	GP-50	3.5	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
41.15	41.35	Outwash channel/reworked moraine deposits	Flat	GP-51	1	1	Silty Sand to Poorly Graded Sand w Silt	no	2.5
41.35	41.67	Till/outwash plain, reworked, upland terrace, boggy	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	11
41.67	41.78	Outwash channel/reworked moraine deposits	Flat		1	1	Silty Sand to Poorly Graded Sand w Silt	no	2.5
41.78	41.81	Alluvial channel	Flat		0.5	0.5	Silty Sand to Poorly Graded Sand w Silt	no	2.5
41.81	41.84	Outwash channel/reworked moraine deposits	Flat		1	1	Silty Sand to Poorly Graded Sand w Silt	no	2.5
41.84	42.7	Till/outwash plain, reworked, upland terrace, boggy	Flat to rolling	GP-52; GP-52.1	1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	11
42.7	42.85	Alluvium, outwash channel/reworked moraine deposits	Flat	GP-53	1	0.5	Poorly Graded Gravel w Silt	no	>5
42.85	44.02	Till/outwash plain, reworked, upland terrace, boggy	Flat to rolling	GP-54	3	0.5	Sandy Silt to Silty Sand	no	4
44.02	44.16	Alluvium, outwash channel/reworked moraine deposits	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
44.16	44.66	Till/outwash plain, reworked, upland terrace, boggy	Flat to rolling	GP-55	3	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
44.66	44.85	Bog, alluvium/outwash channel, reworked	Flat		7	0.5	Peat/OL	no	2
44.85	45.03	Outwash terrace	Flat		1	0.5	Silt over Poorly Graded Sand w Silt	no	5

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground->10
Start	End	Landform							
45.03	46.08	Till/outwash plain, reworked, upland terrace, boggy	Hummocky	GP-56; GP-56.1; GP-57	2	0.5	Peat over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
46.08	46.94	Till, reworked, boggy	Hummocky	GP-58	1	0.5	Silty Sand w Gravel to Silty Gravel	no	4
46.94	46.97	Peat bog, reworked till	Flat		8	0.5	Peat/OL	no	1
46.97	48.42	Till, reworked, boggy	Hummocky		1.5	0.5	Silty Sand w Gravel to Silty Gravel	no	4
48.42	48.45	Peat bog, reworked till	Flat		8	0.5	Peat/OL	no	1
48.45	50.02	Till, reworked, upland, boggy	Rolling to hilly, hummocky	GP-61; GP-62; GP-63	2.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
50.02	50.34	Alluvial channel	Flat	SK-1; SK-2; SK-3	0.5	0.5	Poorly Graded Sand and Gravel w Silt	no	5
50.34	50.63	Alluvial Terrace/Till, reworked	Flat to rolling	GP-64	1.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
50.63	51.63	Till/outwash terrace, reworked, upland, boggy	Flat to hummocky	GP-65; GP-66	1.5	0.5	Peat over Silt Clay w Sand/Sandy Silt to Silty Sand	no	>5
51.63	51.86	Till/outwash plain, reworked, bog	Flat		7	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	1
51.86	53.21	Till/outwash plain, reworked, upland terrace	Flat to rolling	GP-67; GP-68	2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	12
53.21	53.37	Alluvial channel/reworked moraine deposits, boggy	Flat	GP-69	2	1	Poorly Graded Sand and Gravel w Silt	no	2
53.37	54.02	Till, reworked, upland, boggy	Rolling to Hilly	GP-70; GP-70.1	0.5	0.5	Sandy Silt to Silty Sand	no	>7
54.02	54.68	Till, reworked, upland, boggy	Rolling		2	1.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>5
54.68	54.8	Peat bog/reworked till	Flat	GP-71	11	1	Peat/OL	no	0.5
54.8	55.55	Till, reworked, upland, boggy	Rolling	GP-72	2	1	Peat/OL over Sandy Silt to Silty Sand	no	2
55.55	55.61	Peat bog/reworked till	Flat		11	1	Peat/OL	no	0.5
55.61	59.36	Till, reworked, upland, boggy	Rolling	GP-73; GP-74; GP-75; GP-76	3	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
59.36	59.39	Peat bog/alluvium/reworked till	Flat	GP-78	7	1	Peat/OL	no	0.5
59.39	59.48	Till, reworked, upland, boggy	Rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
59.48	59.56	Peat bog/reworked till	Flat		7	1	Peat/OL	no	0.5
59.56	61.69	Till, reworked, upland, boggy	Rolling	GP-79; GP-80	2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2

Pipeline Soil and Permafrost Data

130627 Milepost		Landform	Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg		Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End				Depth (ft)	Organic Mat Thickness (ft)			
61.69	61.72	Peat bog/alluvium/reworked till	Flat	GP-81	6	1	Peat/OL	no	0.5
61.72	61.76	Peat bog/reworked till	Flat		7	1	Peat/OL	no	0.5
61.76	62.85	Till, reworked, upland, boggy	Rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
62.85	62.91	Peat bog/alluvium/reworked till	Flat		6	1	Peat/OL	no	0.5
62.91	64.06	Till, reworked, upland, boggy	Rolling	GP-82	4	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
64.06	64.13	Peat bog/alluvium/reworked till	Flat		6	1	Peat/OL	no	0.5
64.13	64.51	Till, reworked, upland, boggy	Rolling	GP-83	1	0.5	Soft silt over Silty Sand w Gravel	no	1
64.51	64.56	Peat bog/alluvium/reworked till	Flat		6	1	Peat/OL	no	0.5
64.56	66.21	Till, reworked, upland, boggy	Rolling	GP-84; GP-85	3.5	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
66.21	66.24	Alluvium/reworked till, boggy	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
66.24	66.84	Till, reworked, upland, boggy	Rolling	GP-86	2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
66.84	66.88	Alluvium/reworked till, boggy	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
66.88	67.31	Till, reworked, upland, boggy	Flat to hummocky	GP-87	2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
67.31	67.33	Alluvium/reworked till, boggy	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
67.33	67.46	Till, reworked, upland, boggy	Flat to hummocky		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
67.46	67.48	Alluvium/reworked till, boggy	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
67.48	67.62	Till, reworked, upland, boggy	Flat to hummocky		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
67.62	67.68	Peat bog/reworked till	Flat		7	1	Peat/OL	no	0.5
67.68	68.03	Till, reworked, upland, boggy	Flat to hummocky		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
68.03	68.11	Alluvium/reworked till, boggy	Flat to rolling		3	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	2
68.11	70.46	Till, reworked, upland, boggy	Rolling	GP-88; GP-89; GP-90; GP-91	2	1.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
70.46	70.49	Alluvium/reworked till, boggy	Flat to rolling		3	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	2
70.49	71.54	Till, reworked, upland, boggy	Rolling to hummocky	GP-92; GP-93	2	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	7
71.54	71.56	Alluvium/reworked till, boggy	Flat to rolling		3	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	2
71.56	73.05	Till, reworked, upland, boggy	Flat to rolling	GP-94	2	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	2
73.05	73.06	Alluvium/reworked till, boggy	Flat to rolling		3	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	2
73.06	74.62	Till, reworked, upland, boggy	Flat to rolling	GP-95; GP-96; GP-97	2	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	2
74.62	74.63	Alluvium/reworked till, boggy	Flat to rolling		3	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	2
74.63	75.18	Till, reworked, upland, boggy	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	2
75.18	75.21	Alluvium/reworked till, boggy	Flat to rolling		3	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	2
75.21	76.45	Till, reworked, upland, boggy	Flat to rolling	GP-98; GP-99; GP-100	2	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	2
76.45	76.55	Peat bog/reworked till	Flat		11	1	Peat/OL	no	0.5
76.55	76.59	Till, reworked, upland, boggy	Flat		3	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	2
76.59	76.63	Peat bog/reworked till	Flat		11	1	Peat/OL	no	0.5
76.63	76.98	Till, reworked, upland, boggy	Flat	GP-101	3.5	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	2
76.98	78.25	Till, reworked, upland, boggy	Flat to rolling	GP-102	3.5	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	2
78.25	78.5	Outwash terrace, reworked, boggy	Flat to rolling	GP-103	2.5	0.5	Peat/OL over Silty Gravel to Poorly Graded Gravel w Silt	no	5
78.5	78.62	Peat bog/reworked outwash/reworked	Flat		8	1	Peat/OL	no	0.5
78.62	78.66	Outwash terrace, reworked, boggy	Flat to rolling		2.5	0.5	Peat/OL over Silty Gravel to Poorly Graded Gravel w Silt	no	5
78.66	80.2	Till, reworked, upland, boggy	Flat to rolling, hummocky	GP-104; GP-105	2	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	2
80.2	80.34	Peat bog/reworked till	Flat		7	1	Peat/OL	no	0.5
80.34	80.86	Till, reworked, upland, boggy	Flat to rolling, hummocky		2	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	2
80.86	80.91	Alluvium/reworked till, boggy	Flat to rolling		3	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	2

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground
Start	End	Landform			2	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	2
80.91	81.2	Till, reworked, upland, boggy	Flat to rolling, hummocky						
81.2	81.26	Peat bog/reworked till	Flat		7	1	Peat/OL	no	0.5
81.26	82.73	Till, reworked, upland, boggy	Flat to rolling, GP-106; GP-107 hummocky		2	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	3
82.73	82.75	Alluvium/reworked till, boggy	Flat to rolling		3	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	2
82.75	83.13	Outwash/Till, reworked, boggy	Flat to rolling, hummocky		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	3
83.13	83.19	Peat bog/reworked outwash/reworked	Flat		8	1	Peat/OL	no	0.5
83.19	84.35	Outwash/Till, reworked, boggy	Flat to rolling, GP-108; GP-109 hummocky		3	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
84.35	85.84	Outwash terrace, boggy	Flat to rolling, GP-110; GP-111 hummocky		1.5	0.5	Peat/OL over Poorly Graded Gravel w Silt	no	>10
85.84	85.97	Outwash terrace, boggy	Flat to hilly, GP-112 hummocky		2	0.5	Peat/OL over Poorly Graded Gravel w Silt	no	>10
85.97	86.04	Alluvium/Wx Bedrock	Flat		0.5	0.5	Poorly graded Gravel w Silt over Wx Bedrock Weathered bedrock	no	2
86.04	86.07	Weathered Bedrock	Rugged		0	0		no	>10
86.07	86.56	Outwash terrace, boggy	Flat to hilly, GP-113 hummocky		2	0.5	Peat/OL over Poorly Graded Gravel w Silt	no	>10
86.56	86.84	Till, reworked, upland, boggy	Flat to rolling, GP-114 hummocky		2	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	3
86.84	87.15	Outwash terrace, boggy	Flat to rolling, hummocky		1.5	0.5	Peat/OL over Poorly Graded Gravel w Silt	no	>10
87.15	87.23	Till, reworked, upland, boggy	Flat to rolling, hummocky		2	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	3
87.23	87.3	Peat bog/reworked till	Flat to rolling, GP-115 hummocky		4	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	0.5
87.3	87.78	Till, reworked, upland, boggy	Flat to rolling, GP-116 hummocky		2	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	3

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground
Start	End	Landform			1	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Poorly Graded Gravel w Silt	no	4
87.78	88.08	Outwash terrace, boggy	Flat						
88.08	88.1	Till/outwash plain, reworked, upland	Rolling to hummocky		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
88.1	88.12	Outwash terrace, boggy	Flat		1	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Poorly Graded Gravel w Silt	no	4
88.12	90.39	Till, reworked, upland, boggy	Flat to rolling, hummocky	GP-117; GP-118	2	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	3
90.39	90.58	Peat bog/Colluvium/reworked	Rolling	GP-119	3	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	6
90.58	90.86	Colluvium/reworked moraine	Flat to rolling, hummocky		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	3
90.86	91.39	Colluvium/reworked till, boggy	Rolling to hilly, hummocky		3	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
91.39	91.49	Colluvium/reworked moraine	Flat to rolling, hummocky		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	3
91.49	91.52	Alluvium, boggy	Flat to rolling, hummocky		1.5	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Poorly Graded Gravel w Silt	no	2
91.52	91.72	Colluvium/reworked moraine	Flat to rolling, hummocky		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	3
91.72	91.89	Peat bog/reworked till/colluvium	Flat, hummocky	GP-121	7	1	Peat/OL	no	0.5
91.89	92.01	Colluvium/reworked moraine	Flat to rolling, hummocky		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	3
92.01	92.47	Peat bog/reworked till/colluvium	Flat, hummocky	GP-122	13	1	Peat/OL	no	0.5
92.47	92.48	Colluvium/reworked moraine	Flat to rolling, hummocky		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	3
92.48	93.04	Colluvium/reworked till, boggy	Rolling to hummocky	GP-123	1.5	0.5	Peat/OL over Silty Gravel	no	4
93.04	93.19	Colluvium/reworked moraine	Hummocky	GP-124	2	0.5	Peat/OL over Silty Gravel	no	3
93.19	93.81	Till, reworked, upland, boggy	Flat to rolling, hummocky		2	0.5	Peat/OL over Silty Sand/Sandy Silt w gravel	no	3

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground
Start	End	Landform							
93.81	93.83	Alluvium/reworked till, boggy	Flat to hummocky		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Poorly Graded Gravel w Silt	no	2
93.83	94.13	Till, boggy	Flat to hummocky	GP-125	3	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
94.13	94.18	Alluvium/reworked till, boggy	Flat to hummocky		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Poorly Graded Gravel w Silt	no	2
94.18	95.11	Outwash terrace/reworked till	Flat to rolling, hummocky		1	0.5	Silty Sand/Sandy Silt w Gravel to Poorly Graded Gravel w Silt	no	4
95.11	95.13	Alluvium/outwash terrace	Flat		0.5	0.5	Poorly graded Gravel w Silt	no	1
95.13	95.37	Alluvial terrace/outwash terrace	Flat	GP-127	1	0.5	Silty Sand/Sandy Silt w Gravel to Poorly Graded Gravel w Silt	no	10
95.37	96	Outwash terrace/reworked till	Flat to hummocky		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
96	96.01	Peat bog/outwash terrace	Flat	GP-128	10.5	1	Peat/OL	no	1
96.01	96.84	Outwash terrace/reworked till, boggy	Flat to hummocky	GP-129	3	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	7
96.84	96.86	Alluvium/outwash terrace, boggy	Flat		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Poorly Graded Gravel w Silt	no	2
96.86	97.08	Outwash terrace/reworked till, boggy	Flat to hummocky		3	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	7
97.08	97.1	Peat bog/outwash terrace	Flat		10	1	Peat/OL	no	0.5
97.1	97.52	Outwash terrace/reworked till	Flat to hummocky	GP-1-RM	0.5	0.5	Silty Sand w Gravel to Silty Gravel	no	6
97.52	97.54	Peat bog/colluvium/residual soil	Flat		5	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
97.54	98.64	Colluvium/residual soil	Rolling to hilly	GP-2-RM; GP-3-RM	1.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	7
98.64	98.88	Colluvium/residual soil/Wx bedrock,	Flat to rolling, hummocky	GP-3-RM	5.5	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
98.88	99.6	Peat bog/colluvium/residual soil	Flat to rolling, hummocky	GP-4-RM	6	1	Peat/OL over Silty Sand/Sandy Silt w gravel	no	2
99.6	100.52	Till, boggy	Flat to hummocky	GP-5-RM; GP-6-RM	2.5	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground
Start	End	Landform							
100.52	100.7	Outwash/Till, reworked, boggy	Flat to rolling, hummocky	GP-7-RM	2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	7
100.7	101.15	Till/outwash plain, reworked, upland	Flat to rolling	GP-8-RM; GP-137	1	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	5
101.42	101.43	Till, boggy	Flat		5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
101.43	101.52	Till/outwash plain, reworked, upland	Flat to rolling		1	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	5
101.52	101.56	Till, boggy	Flat	GP-138	5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
101.56	101.91	Till/outwash plain, reworked, upland	Flat to rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel	no	2
101.91	102.42	Till/outwash plain, reworked, upland	Flat to rolling	GP-139	0.25	0.25	Silty Sand w Gravel to Silty Gravel	yes	2
102.42	102.61	Till/outwash plain, reworked, upland	Flat to rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel	yes	2
102.61	102.74	Alluvium/Till/outwash plain, reworked	Flat to rolling	GP-140	0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	0.5
102.74	102.82	Till/outwash plain, reworked, upland	Flat to rolling	GP-141	0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	3
102.82	103.8	Till/outwash plain, reworked, upland	Flat to rolling	GP-142	0.5	0.5	Silty Sand w Gravel to Silty Gravel	yes	>10
103.8	104.47	Till/outwash plain, reworked, upland	Rolling		1	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	2
104.47	104.49	Till/outwash plain, reworked, upland,	Flat	GP-143	2	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	2
104.49	105.76	Till/outwash plain, reworked, upland	Flat to rolling	GP-144	1.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	>10
105.76	105.8	Till/outwash plain, reworked, upland	Flat to rolling		1.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	>10
105.8	105.91	Till/outwash plain, reworked, upland	Flat to rolling	GP-145	0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	>10
105.91	105.94	Till/outwash plain, reworked, upland	Flat to rolling		1.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	>10
105.94	105.97	Till/outwash plain, reworked, upland	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
105.97	106.03	Till/outwash plain, reworked, upland	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	>10
106.03	106.05	Till/outwash plain, reworked, upland	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
106.05	106.07	Till/outwash plain, reworked, upland	Flat to rolling		1.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10

Pipeline Soil and Permafrost Data

130627 Milepost		Terrain Description (topography)		Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)		Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform			0.5	1.5	2			
106.07	106.13	Till/outwash plain, reworked, upland	Flat to rolling					Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	>10
106.13	106.14	Till/outwash plain, reworked, upland	Flat to rolling			1.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
106.14	106.2	Till/outwash plain, reworked, upland,	Flat			2	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	2
106.2	106.28	Till/outwash plain, reworked, upland	Flat to rolling			1.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
106.28	106.31	Till/outwash plain, reworked, upland	Flat to rolling			0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
106.31	106.33	Till/outwash plain, reworked, upland	Flat to rolling			1.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	>10
106.33	106.36	Till/outwash plain, reworked, upland	Flat to rolling			0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	>10
106.36	106.38	Till/outwash plain, reworked, upland	Flat to rolling			1.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	>10
106.38	106.39	Till/outwash plain, reworked, upland	Flat to rolling			0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	>10
106.39	106.79	Thin Till	gentle slope						yes	
106.79	106.88	Colluvium Over Till	plain						no	
106.88	106.99	Fluvial Blanket Over Till	gentle slope						no	
106.99	107.15	Colluvium Over Till	plain						no	
107.15	107.27	Thin Till	plain						no	
107.27	107.6	Colluvium Over Till	undulating						no	
107.6	107.7	Colluvium Over Till	gentle slope						no	
107.7	107.93	Colluvium Over Till	undulating						no	
107.93	108.35	Till of Variable Thickness Overlying Undulating Rock	undulating	GP-002-J					no	>14
108.35	108.39	Till Forming a Moderate Slope	steep slope						no	
108.39	108.43	Thin Till Overlying Undulating Rock	undulating	GP-003-J; GP-004-J	0	0	Sand		no	>15, >19.5
108.45	108.5	Flood Plain, Terrace	plain						no	
108.5	108.53	50% Thin Colluvium 50% Rock	steep slope						no	
108.53	109.18	Till Of Variable Thickness Overlying Undulating Rock	undulating	GP-005-J; GP-006-JGP-007-J					no	13, >9.5, >14.5
109.18	109.35	Undulating Till	undulating						no	
109.35	109.4	60% Till Of Variable Thickness 40%	undulating						no	
109.4	110.31	80% Undulating Till 20% Thin Veneer	undulating	GP-008-J					no	4
110.31	110.49	Undulating Till	undulating		1	0	Silt to Gravel and Sand		no	
110.49	110.53	Thick Till	gentle slope						no	

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
110.53	110.65	Thick Till	gentle slope					no	
110.65	110.9	Glaciofluvial Of Variable Thickness	undulating	GP-009-J				no	>8.5
110.9	111.03	Thick Till	moderate slope					no	
111.03	111.07	Thick to Thin Colluvium	fan					no	
111.07	111.11	Thick Till	moderate slope					no	
111.1	111.37	Thick to Thin Colluvium	fan	GP-010-J	0	0	Silty Clay	no	>12
111.37	111.48	Thick Till	gentle slope					no	
111.48	111.92	80% Glaciofluvial Plain 20% plain	plain	GP-011-J				no	0.1
111.92	111.94	Flood Plain	plain					no	
111.94	112.04	Glaciofluvial Forming A Gentle Slope	gentle slope	GP-012-J				no	18
112.04	112.21	Till Of Variable Thickness	gentle slope					no	
112.21	112.28	Colluvium Of Variable Thickness	moderate slope					no	
112.28	112.48	Thin Fluvial Overlying Thick Till	moderate slope	GP-013-J	1	0	Silt to Sand	no	18
112.48	112.7	Till Of Variable Thickness Overlying Undulating Rock	undulating		2	0	Silt	no	
112.7	112.79	Thin Colluvium	gentle slope					no	
112.79	113.11	Thick Till Overlying Undulating Rock	undulating	GP-014-J				no	>20.5
113.11	113.23	Thin Colluvium Overlying Thick Till	gentle slope					no	
113.23	113.3	Fluvial Fan	fan	GP-015-J				no	>15
113.3	113.42	Till Of Variable Thickness Overlying Undulating Rock	undulating					no	
113.42	113.8	Colluvial Fan	fan	GP-016-J	1	0	Gravel and Sand	no	>9
113.8	113.93	Thick Colluvium	moderate slope					no	
113.93	114.26	Colluvial Fan	fan	GP-017-J			Sand and Gravel	no	>8.5
114.26	114.33	Till Of Variable Thickness Overlying Undulating Rock	undulating	GP-018-J				no	>18.5
114.33	114.34	Colluvium Forming A Moderate Slope	moderate slope		1	0	Sandy Silt	no	
114.34	114.39	Thin Fluvial Overlying Undulating Rock	plain	GP-019-J	3	0	Sand to Silt	no	>4
114.39	114.39	Glaciofluvial Fan	fan					no	
114.39	114.44	Thin Colluvium	gentle slope					no	
114.44	114.51	Thick Colluvium	gentle slope					no	
114.51	114.54	Thin Colluvium	gentle slope					no	

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground- 0.5 to >28
Start	End	Landform							
114.54	114.85	Thin Glaciofluvial Overlying Undulating Rock	moderate slope	GP-020-J; GP-021-J; GP-100-J; GP-101-J	1	0	Sand and Silt w trace Gravel	no	0.5 to >28
114.85	115.33	Colluvial Cone	cone	GP-021-J; GP-100-J; GP-101-J					
115.33	115.47	Thick Colluvium	moderate slope					no	
115.47	115.62	Colluvial Fan	fan	GP-022-J; GP-023-J	0	0	Sand and Silt	no	0.2 to 7.5
115.62	115.76	Active Flood Plain	plain	GP-023-J	1	0	Silt to Sand and Gravel	no	0.2
115.76	115.8	Colluvial Fan	fan					no	
115.8	115.82	Active Flood Plain	plain		1	0	Sand and Gravel	no	
115.82	115.9	Colluvial Fan	fan					no	
115.9	115.91	Colluvium Of Variable Thickness	moderate slope		1	0	Silt to Sand and Gravel	no	
115.91	115.92	80% Thin Colluvium 20% Rock	steep slope					no	
115.92	116.11	Colluvium Of Variable Thickness	moderate slope	GP-024-J	1	0	Sand and Gravel	no	7
116.11	116.17	Colluvium Forming A Moderately Steep Slope	moderately steep					no	
116.17	116.3	Till Of Variable Thickness Overlying Undulating Rock	undulating	GP-025-J					>7
116.3	116.33	Colluvium Forming A Moderately Steep Slope	moderately steep					no	
116.33	116.41	Till Of Variable Thickness Overlying Undulating Rock	undulating					no	
116.41	116.42	60% Thin Colluvium 40% Rock	steep slope		1	0	Silt to Sand and Gravel	no	
116.42	116.52	Till Of Variable Thickness Overlying Undulating Rock	undulating		1	0	Silt	no	
116.52	116.52	60% Thin Colluvium 40% Rock	steep slope					no	
116.52	116.88	Till Of Variable Thickness Overlying Undulating Rock	undulating	GP-026-J	1	0	Silt	no	>8
116.88	116.9	Thick Colluvium	gentle slope					no	
116.9	117.27	Till Of Variable Thickness Overlying Undulating Rock	undulating	GP-027-J; GP-102-J; GP-103-J				no	>7.5 to >9
117.27	117.38	80% Colluvium Forming a Moderately Steep to Steep Slope, 20% Rock	steep slope					no	

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground->10
Start	End	Landform							
117.38	117.54	60% Till Of Variable Thickness Overlying Undulating Rock Forming A Moderate Slope, 40% Undulating Rock Forming A Moderate Slope	moderate slope, undulating	GP-104-J				no	>10
117.54	117.82	Till Of Variable Thickness Overlying Undulating Rock	undulating	GP-028-J	0	0	Gravel and Sand	no	>12
117.82	117.85	Glaciofluvial Of Variable Thickness	undulating	GP-029-J				no	>8
117.85	118.07	Glaciofluvial Of Variable Thickness	undulating	GP-029-J	2	0	Sand and Silt to Sand and Gravel	no	>8
118.07	118.08	Glaciofluvial Of Variable Thickness	undulating	GP-029-J				no	>8
118.08	118.2	60% Thick Colluvium 40% Flood Plain	plain		2	0	Sand and Silt to Sand and Gravel	no	
118.2	118.6	Colluvial Cone	cone	GP-105-J, GP-106-J				no	>7.5 to >8.5
118.6	118.87	Undulating Colluvium	undulating	GP-030-J, GP-031-J	2	0	Sand and Silt to Sand and Gravel	no	>8 to >10
118.87	118.98	Thick Colluvium	gentle slope	GP-107-J	1	0	Sandy Silt to Sand and Gravel	no	>5
118.98	119.09	Thick Colluvium	moderate slope					no	
119.09	119.12	Thick Colluvium	gentle slope					no	
119.12	119.19	Thick Colluvium	moderately steep		0	0	Sand and Gravel w Trace Fines	no	
119.19	119.56	Thick Colluvium, Undulating	gentle, undulating	GP-032-J; GP-033-J; GP-108-J				no	0.2 to >11
119.56	119.75	Thick Colluvium	moderate slope	GP-034-J	1	0	Sand and Gravel w Trace Fines	no	>7
119.75	119.76	60% Thin Colluvium 40% Rock	steep slope				Sand and Gravel w Trace Fines	no	
119.76	119.93	Undulating Colluvium	gentle, undulating	GP-035-J; GP-109-J			Sand and Gravel w Trace Fines	no	>8 to >11
119.93	120.17	Thick Colluvium	steep slope	GP-036-J	1	0	Gravel and Sand, Trace Silt	no	0.2
120.17	120.31	Fluvial Fan	moderate slope		1	0	Sandy Silt	no	
120.31	120.33	Fluvial Fan	fan	GP-037-J	0	0	Sand and Gravel w some Silt	no	>19
120.33	120.38	Active Thick Fluvial	gentle slope		1	0	Sandy Silt	no	
120.38	120.43	Thick Colluvium	gentle slope		0	0	Sand and Gravel w some Silt	no	
120.43	120.59	Flood Plain, Terrace	plain		1	0	Sand and Gravel, Cobbles and Boulders	no	
120.59	120.72	Glaciofluvial Of Variable Thickness	undulating					no	

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform			1	0	Sand and Gravel, Cobbles and Boulders	no	
120.72	120.75	Flood Plain, Terrace	plain				Sand and Gravel, Cobbles and Boulders	no	
120.75	120.89	Glaciofluvial Of Variable Thickness	undulating	GP-038-J; GP-038A-J	0	0	Gravel and Sand w Trace Fines	no	>6 to >8.5
120.89	120.93	Thick Fluvial	gentle slope					no	
120.93	121.19	Till Of Variable Thickness Overlying Hummocky	hummocky					no	
121.19	121.43	Colluvial Fan	fan	GP-039-J	0	0	Silty Sand	no	11
121.43	121.91	Colluvium Forming A Moderate Slope	moderate slope	GP-040-J	1	0	Sand and Gravel, Cobbles and Boulders	no	3
121.91	122.24	Flood Plain, Terrace	plain	GP-041-J				no	10
122.24	122.76	Colluvium Forming A Moderate Slope	moderate slope	GP-042-J	1	0	Sand and Gravel, Cobbles and Boulders	no	>22
122.76	122.77	60% Flood Plain 40% Thin Organics	plain					no	
122.77	122.87	Colluvium Forming A Moderate Slope	moderate slope	GP-039-J; GP-041-J	1	0	Sand and Gravel, Cobbles and Boulders	no	10 to 11
122.87	122.88	60% Flood Plain 40% Thin Organics	plain					no	
122.88	122.95	Thick Colluvium	gentle slope					no	
122.95	123.14	60% Flood Plain 40% Thin Organics	plain		1	0	Sand and Gravel, Cobbles and Boulders	no	
123.14	123.18	Active Flood Plain	plain					no	
123.18	123.27	50% Flood Plain 50% Thin Organics	plain	GP-043-J	0	0	Silt and Gravel	no	>22
123.27	124.43	Colluvium Forming A Moderate Slope	moderate slope	GP-044-J; GP-045-J				no	0
124.43	124.99	Glaciofluvial of Variable Thickness	gentle, undulating	GP-046-J; GP-047-J				no	14.5, >9.5
124.99	125.09	50% Thin Colluvium 50% Rock	steep slope		1	0	Sand and Gravel w Trace Fines	no	
125.09	125.47	Till Of Variable Thickness	moderate slope	GP-048-J				no	>15
125.47	126.11	Thick Colluvium	moderate slope	GP-049-J	1	0	Sand and Gravel w Trace Fines	no	>13.5
126.11	126.52	80% Glaciofluvial of Variable Thickness Overlying Undulating Rock, 20% Undulating Rock	moderate slope	GP-050-J				no	>8
126.52	126.71	Thick Colluvium	moderate slope		0	0	Sand w some Silt	no	

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)			Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground->11
Start	End	Landform			1	0	Silt			
126.71	126.86	80% Glaciofluvial of Variable Thickness Overlying Undulating Rock, 20% Undulating Rock	moderate slope	GP-051-J					no	
126.86	126.93	Thick Colluvium	gentle slope		1	0	Silty Sand		no	
126.93	127.22	60% Till Of Variable Thickness Overlying Undulating Rock, 40% Thin Colluvium	undulating	GP-052-J	0	0	Gravel and Sand		no	>26.5
127.22	127.32	Active Flood Plain	plain	GP-053-J	1	0	Gravel and Sand		no	>17
127.31	127.59	60% Fluvial Terrace 40% Thin Organics Overlying Fluvial Terrace	plain	GP-054-J					no	>15
127.59	127.94	80% Till Of Variable Thickness, 20% Undulating Rock Forming a Moderate to Moderately Steep Slope	moderate, 20% Undulating Rock Forming a Moderate to Moderately Steep Slope	GP-055-J	1	0	Silty Gravels to Gravelley Silts		no	>28
127.94	128.46	60% Till Of Variable Thickness, 30% Hummocky Rock, 10% Thin Organics of Rocky Depressions	hummocky	GP-056-J					no	>13.5
128.46	128.82	Colluvial Cone	cone		1	0	Silty Gravels to Gravelley Silts		no	
128.82	129.09	Colluvial Fan	undulating	GP-057-J	3	0	Silty, Gravelley Sands		no	>7
129.09	129.31	Colluvial Fan	fan		2	0	Gravelley Silt		no	
129.31	129.42	Undulating till	undulating	GP-058-J					no	>5.5
129.42	129.7	129.7 Colluvial Fan	fan		2	0	Sand and Gravel w some Silt		no	
129.7	130.03	60% Undulating To Hummocky Rock, 40% Thin Colluvium	undulating to		2	0	Gravelley Silts to Gravelley Sands		no	
130.03	130.07	80% Till Of Variable Thickness, 20% Thin Organics Overlying Till of Variable Thickness	gentle slope		0	0	Gravel and Sand		no	
130.07	130.77	Fluvial Fan	fan	GP-059-J					no	>22
130.77	130.83	Active Flood Plain	plain						no	
130.83	130.89	130.89 50% Thin Colluvium 50% Rock	steep slope						no	
130.89	130.9	130.9 Colluvium Of Variable Thickness	gentle slope						no	
130.9	130.98	130.98 Active Flood Plain	plain	GP-060-J	2	0	Gravel w some sand		no	>20
130.98	131.28	131.28 Colluvial Fan	fan						no	
131.28	131.45	131.45 Active Flood Plain	plain		2	0	Gravel w some sand		no	
131.45	131.75	131.75 Colluvium Forming A Moderate Slope	moderate slope		1	0	Sandy Silt		no	

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)		Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform			GP-061-J	2	0	Gravel w some sand	no	>22
131.75	132.05	Active Flood Plain	plain	GP-062-J		0	0	Sand and Gravel w Trace Fines	no	>12
132.05	132.58	Active Fluvial Fan	fan						no	
132.58	133.03	Fluvial Fan	fan						no	
133.03	133.18	Active Flood Plain	plain						no	
133.18	133.76	Fluvial Fan	fan	GP-063-J		1	0	Gravel and Sand	no	>5.5
133.76	134.05	Active Flood Plain	plain						no	
134.05	134.11	Colluvial Fan	fan	GP-064-J		1	0	Gravel and Sand	no	>7
134.11	134.38	Active Flood Plain	plain						no	
134.38	134.67	Colluvial Fan	fan	GP-065-J					no	>24
134.67	134.72	50% Flood Plain 50% Active Flood Plain	plain						no	
134.72	134.8	Colluvial Fan	fan			0	0	Gravel and Sand	no	
134.8	135.42	50% Flood Plain 50% Active Flood Plain	plain	GP-066-J					no	>22
135.42	136.49	Fluvial Fan	fan	GP-067-J; GP-068-J		0	0	Clayey Silt	no	>8.5 to >12
136.49	136.66	Active Flood Plain	plain	GP-069-J		1	0	Gravelley Sand and Silt	no	10
136.66	136.94	Active Fluvial Fan	fan	GP-070-J					no	>6.5
136.94	137.27	Colluvial Fan	fan	GP-071-J		0	0	Sandy Gravel	no	>10
137.27	137.42	Flood Plain, Terrace	plain			1	0	Sand and Gravel w some Silt	no	
137.42	137.7	Active Flood Plain	plain	GP-072-J; GP-073-J					no	4 to 7
137.7	137.7	Colluvial Fan	fan			0	0	Sandy Gravel w some silt	no	
137.7	137.8	60% Till forming a steep slope, 40% Rock	steep slope						no	
137.8	138.78	60% Thin Till Overlying Rock Terrace, 40% Till	flat	GP-074-J; GP-075-J		0	0	Sandy Gravel w some silt	no	>14 to >16.5
138.78	138.99	Colluvial Slope, Fan	fan	GP-076-J		1	0	Gravel w some Sand	no	>14.5
138.99	139.04	80% Thin Colluvium 20% Rock	moderately steep			0	0	Gravel and Sand w Trace Fines	no	
139.04	139.13	Colluvial Slope, Fan	fan	GP-075-J; GP-076-J					no	>14 to >14.5
139.13	139.19	80% Thin Colluvium 20% Rock	moderately steep			0	0	Gravelley Sand	no	
139.19	139.33	Colluvial Slope, Fan	fan	GP-077-J		0	0	Gravelley Sand	no	>18
139.33	139.41	80% Thin Colluvium 20% Rock	moderately steep			0	0	Gravelley Sand	no	
139.41	139.78	Till Of Variable Thickness Overlying Undulating Rock	undulating	GP-078-J		0	0	Silty Clay to Sandy Gravel	no	>14
139.78	139.86	80% Thin Colluvium 20% Rock	steep slope			0	0	Gravel and Sand w Trace Fines	no	
139.86	139.89	Active Flood Plain	plain						no	
139.89	139.9	Glaciofluvial Forming A Moderately Steep to Steep Slope	moderately steep			0	0	Gravelley Sand	no	

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform						no	
139.9	139.94	Glaciofluvial Forming A Moderate To Moderately Steep Slope	moderate slope		1	0	Gravel and Sand w some Silt	no	>8.5
139.94	140.26	Thick Glaciofluvial	moderate slope	GP-079-J					
140.26	140.53	Thick Colluvium	gentle slope		1	0	Gravel and Sand w some Silt	no	
140.53	140.6	Thick Glaciofluvial	gentle slope						
140.6	141.07	Thin Glaciofluvial Overlying Undulating Rock	undulating	GP-080-J; GP-081-J				no	>22
141.07	141.09	Thick Colluvium	moderate slope		1	0	Gravel and Sand w some Silt	no	
141.09	141.14	Till Forming A Moderate Slope	moderate slope						
141.14	141.14	Colluvium Of Variable Thickness	moderate slope		1	0	Gravel and Sand w some Silt	no	
141.14	141.63	Thick Colluvium	gentle slope						
141.63	141.68	Thick Glaciofluvial	moderate slope		1	0	Gravel and Sand w some Silt	no	
141.68	141.72	Thick Colluvium	gentle slope						
141.72	141.82	Thick Glaciofluvial	gentle slope	GP-082-J	1	0	Gravel and Sand w some Silt	no	0.5
141.82	141.82	Thick Colluvium	gentle slope						
141.82	142.01	Thick Glaciofluvial	moderate slope		0	0	Sand and Gravel w some Silt	no	
142.01	142.03	Glaciofluvial Forming A Moderate Slope	moderate slope		1	0	Gravelley Sand	no	
142.03	142.39	Thick Glaciofluvial	moderate slope		0	0	Sand and Gravel w some Silt	no	
142.39	142.88	Thin Glaciofluvial Overlying Hummocky Rock	hummocky	GP-083-J	1	0	Gravelley Sand	no	>18
142.88	143.32	60% Till Of Variable Thickness Overlying Undulating Rock, 40% Thin Organics	undulating						
143.32	143.67	Till Of Variable Thickness	moderate slope	GP-084-J	0	0	Sand and Gravel w some Silt	no	>12.5
143.67	143.7	Thick Till	gentle slope						
143.7	143.75	80% Till Of Variable Thickness 20% Rock Ridges	ridged		1	0	Sandy Gravel	no	
143.75	143.79	Till Of Variable Thickness	gentle slope						
143.79	143.94	Thick Till	moderate slope						
143.94	144.1	Thin Organics Overlying Thick Till	gentle slope		1	0	Sand and Gravel w Trace Fines	no	

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)			Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-0 to >11.5
Start	End	Landform			0	Organic Mat Thickness (ft)				
144.1	144.99	Flood Plain	plain	GP-085-J; GP-086-J; GP-087-J	0	0	Sandy Gravel	no	0 to >11.5	
144.99	145.59	50% Flood Plain 50% Active Flood	plain	GP-088-J				no	13	
145.59	146.31	Flood Plain	plain					no		
146.31	146.93	Active Flood Plain	plain	GP-089-J; GP-090-J	0	0	Sand and Gravel w some Clay	no	1 to >5.5	
146.93	147.53	Flood Plain	plain					no		
147.52	147.65	Fluvial Terrace	flat	GP-091-J	0	0	Gravel and Sand	no	>14	
147.65	147.8	Glaciofluvial Of Variable Thickness	undulating					no		
147.8	147.91	Flood Plain	plain		3	0	Sand and Gravel w some Silt	no		
147.91	148.04	Thick Till Overlying Undulating Rock	undulating					no		
148.04	148.22	60% Till Of Variable Thickness Overlying Undulating Rock, 40% Undulating Rock	undulating		1	0	Sandy Silt	no		
148.22	148.3	60% Flood Plain 40% Thin Organics	plain					no		
148.3	148.54	80% Till Of Variable Thickness 20% Undulating Rock	undulating	GP-092-J				no	>10	
148.54	148.81	60% Hummocky Rock 40% Till of Variable Thickness	hummocky	GP-093-J; GP-094-J	2	0	Sandy Clay w some Silt	no	10, >7.5	
148.81	148.92	Till Of Variable Thickness Overlying Rock	gentle slope					no		
148.92	148.98	Thin Organics Overlying Flood Plain	plain					no		
148.98	149.05	Thick Till	gentle slope		0	0	Gravel and Sand	no		
149.05	149.28	80% Rolling Rock 20% Thin Organics	rolling					no		
149.28	149.33	Till of Variable Thickness	moderate slope		0	0	Gravel and Sand w some Silt	no		
149.33	149.37	Thick Colluvium	moderate slope					no		
149.37	149.55	Flood Plain, Terrace	plain	GP-095-J	0	0	Silt w some Clay	no	0	
149.55	149.58	Active Flood Plain	plain					no		
149.57	149.58	60% Active Flood Plain, 40% Thin Organics Overlying Flood Plain	plain		0	0	Silt w some Clay	no		
149.58	149.63	Colluvium Forming A Moderate Slope	moderate slope					no		
149.63	149.68	Thin Colluvium	gentle slope		0	0	Sand and Gravel	no		

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
149.68	149.78	Thin Till	moderate slope					no	
149.78	149.82	50% Thin Colluvium 50% Rock	steep slope					no	
149.82	149.91	Till Of Variable Thickness	moderate slope	GP-096-J				no	>15.5
149.91	149.99	Thick Till	moderate slope		1	0	Silt and Clay	no	
149.98	150.04	Colluvium Of Variable Thickness	moderate slope					no	
150.04	150.13	Till Of Variable Thickness Overlying Undulating Rock forming a Moderate Slope	moderate, undulating		1	0	Silt w some Sand	no	
150.13	150.27	60% Hummocky Rock 40% Till of Variable Thickness	hummocky		0	0	Gravelley Silty Sand	no	
150.27	150.42	80% Till Of Variable Thickness 20% Rock	rolling					no	
150.42	150.47	Till Of Variable Thickness Overlying Undulating Rock	undulating					no	
150.47	151.03	Flood Plain	plain	GP-097-J	0	0	Sandy Silt to Sandy Gravel	no	0
151.03	151.34	Thin Organics Overlying Glaciofluvial	plain					no	
151.4	151.43	Thin Organics Overlying Glaciofluvial	plain	GP-098-J	0	0	Silty Clay w some Gravel	no	>13.5
151.43	151.65	Colluvial blanket over Till	moderate slope					no	
151.65	151.91	Flood Plain	plain					no	
151.91	152.4	Thin Organics Overlying Till and Rock	moderate slope	GP-099-J				no	11
152.4	152.44	Thin Organics Overlying a Flood Plain	moderate slope					no	
152.44	152.44	Flood Plain	plain					no	
152.44	152.45	Thin Organics Overlying a Flood Plain	plain					no	
152.45	152.46	Flood Plain	plain					no	
152.46	152.47	Thin Organics Overlying a Flood Plain	plain					no	
152.47	152.56	Flood Plain	plain					no	
152.56	152.68	Thin Organics Overlying a Flood Plain	plain					no	
152.68	152.74	Thin Organics Overlying Flood Plain Forming a Gentle Slope	plain					no	

Pipeline Soil and Permafrost Data

130627 Milepost		Landform	Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End							yes	Ground-
152.74	152.76	Thin Colluvium over Rock and Glaciofluvial forming a Steep Slope	steep slope						
152.76	152.82	Thin Organics Overlying a Flood Plain	gently sloping plain					yes	
152.82	152.9	Thin Organics Overlying a Flood Plain	gently sloping plain					yes	
152.9	153.16	Colluvial Fan	fan					no	
153.16	153.17	Alluvial fan, boggy	Flat to rolling		2	0.25	Peat/OL over Poorly Graded Gravel w Silt to Silty Gravel	no	2
153.17	153.39	Alluvial fan	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel	no	4
153.39	153.41	Outwash	Flat to rolling	GP-212	1	0.5	Poorly Graded Gravel w Silt	no	5
153.41	153.44	Alluvial fan, boggy	Flat to rolling		2	0.25	Peat/OL over Poorly Graded Gravel w Silt to Silty Gravel	no	2
153.44	153.48	Alluvial fan, boggy	Flat to rolling		2	0.25	Peat/OL over Poorly Graded Gravel w Silt to Silty Gravel	yes	Frozen
153.48	153.58	Alluvial fan, boggy	Flat to rolling		2	0.25	Peat/OL over Poorly Graded Gravel w Silt to Silty Gravel	no	2
153.58	153.63	Alluvial fan, boggy	Flat to rolling		2	0.25	Peat/OL over Poorly Graded Gravel w Silt to Silty Gravel	yes	Frozen
153.63	153.69	Alluvial fan, boggy	Flat to rolling		2	0.25	Peat/OL over Poorly Graded Gravel w Silt to Silty Gravel	no	2
153.69	153.74	Alluvial fan, boggy	Flat to rolling		2	0.25	Peat/OL over Poorly Graded Gravel w Silt to Silty Gravel	yes	Frozen
153.74	153.76	Alluvial fan, boggy	Flat to rolling		2	0.25	Peat/OL over Poorly Graded Gravel w Silt to Silty Gravel	no	2
153.76	154.02	Outwash terrace	Flat to rolling	GP-213	0.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	no	>10
154.02	154.03	Outwash terrace	Flat to rolling		0.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	yes	>10
154.03	154.04	Outwash terrace	Flat to rolling		0.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	no	>10
154.04	154.05	Outwash	Flat to rolling		1	0.5	Silty Gravel	no	5
154.05	154.11	Outwash	Flat to rolling		1	0.5	Silty Gravel	yes	Frozen
154.11	154.14	Outwash	Flat to rolling		0.5	0.25	Silty Gravel	no	1
154.14	154.41	Outwash	Flat to rolling		1	0.5	Silty Gravel	yes	Frozen
154.41	154.43	Outwash	Flat to rolling		0.5	0.25	Silty Gravel	no	1
154.43	154.46	Outwash	Flat to rolling		1	0.5	Silty Gravel	yes	Frozen
154.46	154.49	Outwash	Flat to rolling		0.5	0.25	Silty Gravel	no	1
154.49	154.71	Outwash	Flat to rolling	GP-214	1	0.5	Silty Gravel	yes	Frozen
154.71	154.73	Outwash	Flat to rolling		0.5	0.25	Silty Gravel	no	1
154.73	154.82	Outwash	Flat to rolling		1	0.5	Silty Gravel	yes	Frozen
154.82	154.98	Outwash	Flat to rolling		0.5	0.25	Silty Gravel	no	1
154.98	154.99	Outwash	Flat to rolling		1	0.5	Silty Gravel	yes	Frozen

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)		Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform			0.5	1				
154.99	155	Outwash	Flat to rolling		0.5	0.25	Silty Gravel		no	1
155	155.03	Outwash	Flat to rolling		1	0.5	Silty Gravel		yes	Frozen
155.03	155.11	Outwash	Flat to rolling		0.5	0.25	Silty Gravel		no	1
155.11	155.13	Outwash	Flat to rolling		1	0.5	Silty Gravel		yes	Frozen
155.13	155.17	Outwash	Flat to rolling		0.5	0.25	Silty Gravel		no	1
155.17	156.17	Alluvial fan	Flat to rolling	GP-215	1.5	0.5	Poorly Graded Gravel to Poorly Graded Gravel w Silt		no	>10
156.17	156.24	Outwash	Flat	GP-215A	0.5	0.5	Silty Sand/Sandy Silt over Poorly Graded Gravel		no	6
156.24	156.31	Alluvial terrace	Flat		0.25	0.25	Silty Sand/Sandy Silt over Poorly Graded Gravel		no	4
156.31	156.62	Alluvium/active channel	Flat	GP-216	0	0	Poorly Graded Gravel to Poorly Graded Gravel w Silt		no	1
156.62	156.77	Alluvial terrace	Flat		0.25	0.25	Silty Sand/Sandy Silt over Poorly Graded Gravel		no	4
156.77	157.38	Outwash	Flat	GP-217	1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel		no	>10
157.38	157.52	Colluvium/alluvium	Flat to rolling		1	0.5	Silty Sand/Sandy Silt over Poorly Graded Gravel w Gravel		no	4
157.52	157.69	Colluvium/alluvium	Flat to rolling		1	0.5	Silty Sand/Sandy Silt over Poorly Graded Gravel w Gravel		yes	Frozen
157.69	157.7	Colluvium/alluvium	Flat to rolling		1	0.5	Silty Sand/Sandy Silt over Poorly Graded Gravel w Gravel		no	4
157.7	157.78	Colluvium/alluvium	Flat to rolling		1	0.5	Silty Sand/Sandy Silt over Poorly Graded Gravel w Gravel		yes	Frozen
157.78	157.8	Colluvium/alluvium	Flat to rolling		1	0.5	Silty Sand/Sandy Silt over Poorly Graded Gravel w Gravel		no	4
157.8	157.84	Colluvium/alluvium	Flat to rolling		1	0.5	Silty Sand/Sandy Silt over Poorly Graded Gravel w Gravel		yes	Frozen
157.84	157.95	Colluvium/alluvium	Flat to rolling	GP-218	4	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel		no	2
157.95	158.02	Colluvium/alluvium	Flat to rolling		1	0.5	Silty Sand/Sandy Silt over Poorly Graded Gravel w Gravel		yes	Frozen
158.02	158.05	Colluvium/alluvium	Flat to rolling		4	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel		no	2
158.05	158.11	Colluvium/alluvium	Flat to rolling		1	0.5	Silty Sand/Sandy Silt over Poorly Graded Gravel w Gravel		yes	Frozen
158.11	158.15	Colluvium/alluvium	Flat to rolling		2	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel		no	4
158.15	158.17	Colluvium/alluvium	Flat to rolling		1	0.5	Silty Sand/Sandy Silt over Poorly Graded Gravel w Gravel		yes	Frozen
158.17	158.18	Colluvium/alluvium	Flat to rolling		2	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel		no	4

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-Frozen
Start	End	Landform							
158.18	158.33	Colluvium/alluvium	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
158.33	158.36	Colluvium/alluvium	Flat to rolling		3	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
158.36	158.78	Colluvium/alluvium	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
158.78	158.84	Colluvium/alluvium	Flat to rolling		3	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
158.84	158.89	Colluvium/alluvium	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
158.89	158.92	Colluvium/alluvium	Flat to rolling		3	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
158.92	159.14	Colluvium/alluvium	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
159.14	159.21	Colluvium/alluvium	Flat to rolling		4	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
159.21	159.5	Colluvium/alluvium	Flat to rolling	GP-219	1.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	yes	Frozen
159.5	159.51	Colluvium/alluvium	Flat to rolling		1.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
159.51	159.61	Colluvium/alluvium	Flat to rolling		1.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	yes	Frozen
159.61	159.71	Colluvium/alluvium	Flat to rolling		3	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
159.71	159.76	Colluvium/alluvium	Flat to rolling		1.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	yes	Frozen
159.76	159.77	Colluvium/alluvium	Flat to rolling		2	0.5	Silty Sand/Sandy Silt/Lean Clay w Gravel	no	4
159.77	159.78	Colluvium/alluvium	Flat to rolling		1.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	yes	Frozen
159.78	159.89	Colluvium/alluvium	Flat to rolling	GP-220	2	0.5	Silty Sand/Sandy Silt/Lean Clay w Gravel	no	4
159.89	159.91	Colluvium/alluvium	Flat to rolling		1.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	yes	Frozen
159.91	159.92	Colluvium/alluvium	Flat to rolling		2	0.5	Silty Sand/Sandy Silt/Lean Clay w Gravel	no	4
159.92	159.93	Colluvium/alluvium	Flat to rolling		1.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	yes	Frozen
159.93	160.01	Colluvium/alluvium	Flat to rolling		2	0.5	Silty Sand/Sandy Silt/Lean Clay w Gravel	no	4
160.01	160.08	Colluvium/alluvium	Flat to rolling		1.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	yes	Frozen
160.08	160.17	Colluvium/alluvium	Flat to rolling		2	0.5	Silty Sand/Sandy Silt/Lean Clay w Gravel	no	4

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-Frozen
Start	End	Landform							
160.17	160.18	Colluvium/alluvium	Flat to rolling		1.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	yes	
160.18	160.21	Colluvium/alluvium	Flat to rolling		2	0.5	Silty Sand/Sandy Silt/Lean Clay w Gravel	no	4
160.21	160.25	Colluvium/alluvium	Flat to rolling		1.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	yes	Frozen
160.25	160.27	Colluvium/alluvium	Flat to rolling		2	0.5	Silty Sand/Sandy Silt/Lean Clay w Gravel	no	4
160.27	160.39	Colluvium/alluvium	Flat to rolling		1.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	yes	Frozen
160.39	160.43	Colluvium/alluvium	Flat to rolling		2	0.5	Silty Sand/Sandy Silt/Lean Clay w Gravel	no	4
160.43	160.44	Colluvium/alluvium	Flat to rolling		1.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	yes	Frozen
160.44	160.46	Colluvium/alluvium	Flat to rolling		2	0.5	Silty Sand/Sandy Silt/Lean Clay w Gravel	no	4
160.46	160.52	Colluvium/alluvium	Flat to rolling		0.5	0.5	Poorly to well- graded Gravel w Silt	no	4
160.52	160.57	Colluvium/alluvium	Flat to rolling		0.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	yes	Frozen
160.57	160.6	Colluvium/alluvium	Flat to rolling		0.5	0.5	Poorly to well- graded Gravel w Silt	no	4
160.6	160.64	Colluvium/alluvium	Flat to rolling		0.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	yes	Frozen
160.64	160.65	Colluvium/alluvium	Flat to rolling		0.5	0.5	Poorly to well- graded Gravel w Silt	no	4
160.65	160.67	Colluvium/alluvium	Flat to rolling		0.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	yes	Frozen
160.67	160.68	Colluvium/alluvium	Flat to rolling		0.5	0.5	Poorly to well- graded Gravel w Silt	no	4
160.68	160.7	Colluvium/alluvium	Flat to rolling		0.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	yes	Frozen
160.7	160.92	Colluvium/alluvium	Flat to rolling	GP-221	0.5	0.5	Poorly to well- graded Gravel w Silt	no	4
160.92	161.07	Alluvium/active channel	Flat to rolling		0.5	0.5	Poorly to well- graded Gravel w Silt	no	2
161.07	161.4	Colluvium/alluvium	Flat to rolling		0.5	0.5	Poorly to well- graded Gravel w Silt	no	4
161.4	161.41	Reworked till/Outwash	Flat to rolling		0.5	0.5	Silty/Clayey Sand w Gravel to Silty Gravel	no	>10
161.41	161.45	Reworked till/Outwash	Flat to rolling		0.5	0.5	Silty/Clayey Sand w Gravel to Silty Gravel	yes	Frozen
161.45	161.46	Reworked till/Outwash	Flat to rolling		0.5	0.5	Silty/Clayey Sand w Gravel to Silty Gravel	no	>10

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)		Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-Frozen
Start	End	Landform			0.5	2	0.5	Silty/Clayey Sand w Gravel to Silty Gravel	yes	
161.46	161.47	Reworked till/Outwash	Flat to rolling					Peat/OL over Silty/Clayey Sand w Gravel to Silty Gravel	no	4
161.47	161.52	Reworked till/Outwash	Flat to rolling		0.5	0.5	0.5	Silty/Clayey Sand w Gravel to Silty Gravel	yes	Frozen
161.52	161.64	Reworked till/Outwash	Flat to rolling		2	0.5	0.5	Peat/OL over Silty/Clayey Sand w Gravel to Silty Gravel	no	4
161.64	161.71	Reworked till/Outwash	Flat to rolling		0.5	0.5	0.5	Silty/Clayey Sand w Gravel to Silty Gravel	yes	Frozen
161.71	161.73	Reworked till/Outwash	Flat to rolling		2	0.5	0.5	Peat/OL over Silty/Clayey Sand w Gravel to Silty Gravel	no	4
161.73	161.77	Reworked till/Outwash	Flat to rolling		0.5	0.5	0.5	Silty/Clayey Sand w Gravel to Silty Gravel	yes	Frozen
161.77	161.88	Reworked till/Outwash	Flat to rolling		0.5	0.5	0.5	Peat/OL over Silty/Clayey Sand w Gravel to Silty Gravel	no	>10
161.88	161.93	Reworked till/Outwash	Flat to rolling		2	0.5	0.5	Silty/Clayey Sand w Gravel to Silty Gravel	yes	Frozen
161.93	161.97	Reworked till/Outwash	Flat to rolling		0.5	0.5	0.5	Peat/OL over Silty/Clayey Sand w Gravel to Silty Gravel	no	4
161.97	162.01	Reworked till/Outwash	Flat to rolling		2	0.5	0.5	Silty/Clayey Sand w Gravel to Silty Gravel	yes	Frozen
162.01	162.11	Reworked till/Outwash	Flat to rolling		0.5	0.5	0.5	Peat/OL over Silty/Clayey Sand w Gravel to Silty Gravel	no	4
162.11	162.28	Reworked till/Outwash	Flat to rolling		2	0.5	0.5	Silty/Clayey Sand w Gravel to Silty Gravel	yes	Frozen
162.28	162.38	Reworked till/Outwash	Flat to rolling	GP-222	0.5	0.5	0.5	Peat/OL over Silty/Clayey Sand w Gravel to Silty Gravel	no	4
162.38	162.4	Reworked till/Outwash	Flat to rolling		0.5	0.5	0.5	Silty/Clayey Sand w Gravel to Silty Gravel	yes	Frozen
162.4	162.47	Reworked till/Outwash	Flat to rolling		2	0.5	0.5	Peat/OL over Silty/Clayey Sand w Gravel to Silty Gravel	no	4
162.47	162.51	Reworked till/Outwash	Flat to rolling		0.5	0.5	0.5	Silty/Clayey Sand w Gravel to Silty Gravel	yes	Frozen
162.51	162.57	Alluvium/active channel	Flat to rolling		2	0.5	0.5	Poorly to well- graded Gravel w Silt	no	2
162.57	162.63	Reworked moraine	Flat to rolling		0.5	0.5	0.5	Peat/OL over Silty/Clayey Sand w Gravel to Silty Gravel	no	4
162.63	162.71	Reworked moraine	Flat to rolling		2	0.5	0.5	Silty/Clayey Sand w Gravel to Silty Gravel	yes	Frozen
162.71	162.75	Reworked moraine	Flat to rolling		0.5	0.5	0.5	Peat/OL over Silty/Clayey Sand w Gravel to Silty Gravel	no	4
162.75	162.78	Reworked moraine	Flat to rolling		2	0.5	0.5	Silty/Clayey Sand w Gravel to Silty Gravel	yes	Frozen
162.78	162.82	Reworked moraine	Flat to rolling		0.5	0.5	0.5	Poorly Graded Gravel w Silt	no	4

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-Frozen
Start	End	Landform							
162.82	162.84	Reworked moraine	Flat to rolling		0.5	0.5	Silty/Clayey Sand w Gravel to Silty Gravel	yes	Frozen
162.84	162.85	Reworked moraine	Flat to rolling		0.5	0.5	Poorly Graded Gravel w Silt	no	4
162.85	162.87	Outwash/reworked till	Flat to rolling		0.5	0.5	Poorly Graded Gravel w Silt	no	3
162.87	162.89	Outwash/reworked till	Flat to rolling		0.5	0.5	Poorly Graded Gravel w Silt	yes	Frozen
162.89	163.14	Outwash/reworked till	Flat to rolling	GP-223	0.5	0.5	Poorly Graded Gravel w Silt	no	3
163.14	163.15	Reworked moraine	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
163.15	163.2	Reworked moraine	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
163.2	163.21	Reworked moraine	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
163.21	163.22	Reworked moraine	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
163.22	163.35	Reworked moraine	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
163.35	163.42	Reworked moraine	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
163.42	163.48	Reworked moraine	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
163.48	163.53	Reworked moraine	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
163.53	163.56	Reworked moraine	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
163.56	163.75	Reworked moraine	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
163.75	163.81	Reworked moraine	Flat to rolling	GP-224	3	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
163.81	163.97	Reworked moraine, boggy	Flat		3	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
163.97	164.18	Reworked moraine	Flat to rolling		3	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
164.18	164.18	Reworked moraine	Flat to rolling		3	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
164.18	164.28	Alluvium/reworked moraine	Flat		0.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	no	2
164.28	164.55	Alluvium/colluvium	Flat to rolling		1	0.5	Poorly Graded Gravel w Silt to Silty Gravel	no	4
164.55	165.11	Outwash	Flat to rolling	GP-225	1	0.5	Poorly Graded Gravel w Silt	no	>10
165.11	165.15	Reworked moraine	Flat to rolling		3	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	3
165.15	165.21	Reworked moraine	Flat to rolling		3	0.5	Ice-rich Peat/OL over Silty Sand/Sandy Silt w Gravel	yes	Frozen

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground
Start	End	Landform							
165.21	165.26	Reworked moraine	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	4
165.26	165.27	Reworked moraine	Flat to rolling		3	0.5	Ice-rich Peat/OL over Silty Sand/Sandy Silt w Gravel	yes	Frozen
165.27	165.36	Reworked moraine	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	4
165.36	165.37	Reworked moraine	Flat to rolling		3	0.5	Ice-rich Peat/OL over Silty Sand/Sandy Silt w Gravel	yes	Frozen
165.37	165.39	Reworked moraine	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	4
165.39	165.48	Reworked moraine	Flat to rolling		3	0.5	Ice-rich Peat/OL over Silty Sand/Sandy Silt w Gravel	yes	Frozen
165.48	165.57	Reworked moraine	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	4
165.57	165.6	Reworked moraine	Flat to rolling		3	0.5	Ice-rich Peat/OL over Silty Sand/Sandy Silt w Gravel	yes	Frozen
165.6	165.76	Reworked moraine	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	4
165.76	166.16	Reworked moraine	Flat to rolling	GP-226	3	0.5	Ice-rich Peat/OL over Silty Sand/Sandy Silt w Gravel	yes	Frozen
166.16	166.16	Reworked moraine	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	4
166.16	166.22	Alluvium/reworked moraine	Flat		0.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	no	2
166.22	166.22	Reworked moraine	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	4
166.22	166.6	Reworked moraine	Flat to rolling		3	0.5	Ice-rich Peat/OL over Silty Sand/Sandy Silt w Gravel	yes	Frozen
166.6	166.66	Reworked moraine	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
166.66	167	Reworked moraine	Flat to rolling; kettles	GP-227	2.5	0.5	Ice-rich Peat/OL Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
167	167.03	Reworked moraine	Flat to rolling; kettles		2.5	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	3
167.03	167.15	Reworked moraine	Flat to rolling; kettles		2.5	0.5	Ice-rich Peat/OL Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
167.15	167.17	Reworked moraine	Flat to rolling; kettles		2.5	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	3

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-Frozen
Start	End	Landform							
167.17	167.6	Reworked moraine	Flat to rolling; kettles		2.5	0.5	Ice-rich Peat/OL Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	
167.6	167.62	Reworked moraine	Flat to rolling; kettles		2.5	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	3
167.62	167.69	Reworked moraine	Flat to rolling; kettles		2.5	0.5	Ice-rich Peat/OL Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
167.69	168.12	Kettle and kame/ice-contact deposits	Hummocky	GP-228	13.5	9	Ice-rich Organic Silt/Peat	yes	Frozen
168.12	168.13	Kettle and kame/ice-contact deposits	Hummocky		1.5	1	Organic Silt/Peat	no	2
168.13	168.56	Alluvium	Flat	GP-229	0	0	Poorly Graded Gravel to Poorly Graded Gravel w Silt	no	0
168.56	169.61	Reworked moraine	Hummocky	GP-230	1.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	1.5
169.61	169.75	Kettle and kame/reworked moraine	Hummocky	GP-231	1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	5
169.75	169.78	Kettle and kame/reworked moraine	Hummocky		1	0.5	Ice-rich Peat/OL Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
169.78	169.91	Kettle and kame/reworked moraine	Hummocky		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	5
169.91	169.96	Kettle and kame/reworked moraine	Hummocky		1	0.5	Ice-rich Peat/OL Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
169.96	169.98	Kettle and kame/reworked moraine	Hummocky		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	5
169.98	170.06	Kettle and kame/reworked moraine	Hummocky		1	0.5	Ice-rich Peat/OL Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
170.06	170.23	Kettle and kame/reworked moraine	Hummocky		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	5
170.23	170.28	Kettle and kame/reworked moraine	Hummocky		1	0.5	Ice-rich Peat/OL Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
170.28	170.37	Kettle and kame/reworked moraine	Hummocky		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	5
170.37	170.69	Outwash	Flat to rolling		0.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	no	4
170.69	170.84	Alluvial terrace/alluvium	Flat		0.5	0.5	Poorly Graded Gravel to Poorly Graded Gravel w Silt	no	4

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)		Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground
Start	End	Landform			0	0				
170.84	171	Alluvium	Flat	GP-232				Poorly Graded Gravel to Poorly Graded Gravel w Silt	no	1
171	171.74	Outwash/alluvial fan	Flat		0.5	0.5		Poorly Graded Gravel to Poorly Graded Gravel w Silt	no	4
171.74	172.89	Outwash	Flat to rolling	GP-233; GP-234	1	0.5		Poorly Graded Gravel w Silt to Silty Gravel	no	4
172.89	172.97	Colluvium/alluvium	Flat to rolling		2	0.5		Poorly Graded Gravel to Poorly Graded Gravel w Silt	no	2
172.97	172.98	Outwash	Flat to rolling		2	0.5		Peat/OL over Silty Sand/Sandy Silt over Poorly Graded Gravel w Silt	no	4
172.98	172.99	Outwash	Flat to rolling		2	0.5		Peat/OL over Silty Sand/Sandy Silt over Poorly Graded Gravel w Silt	yes	Frozen
172.99	173	Outwash	Flat to rolling		2	0.5		Peat/OL over Silty Sand/Sandy Silt over Poorly Graded Gravel w Silt	no	4
173	173.02	Outwash	Flat to rolling		2	0.5		Peat/OL over Silty Sand/Sandy Silt over Poorly Graded Gravel w Silt	yes	Frozen
173.02	173.06	Outwash	Flat to rolling		2	0.5		Peat/OL over Silty Sand/Sandy Silt over Poorly Graded Gravel w Silt	no	4
173.06	173.19	Outwash	Flat to rolling		2	0.5		Peat/OL over Silty Sand/Sandy Silt over Poorly Graded Gravel w Silt	yes	Frozen
173.19	173.21	Outwash	Flat to rolling		2	0.5		Peat/OL over Silty Sand/Sandy Silt over Poorly Graded Gravel w Silt	no	4
173.21	173.22	Outwash	Flat to rolling		2	0.5		Peat/OL over Silty Sand/Sandy Silt over Poorly Graded Gravel w Silt	yes	Frozen
173.22	173.26	Outwash	Flat to rolling		2	0.5		Peat/OL over Silty Sand/Sandy Silt over Poorly Graded Gravel w Silt	no	4
173.26	173.33	Outwash	Flat to rolling	GP-235	2	0.5		Peat/OL over Silty Sand/Sandy Silt over Poorly Graded Gravel w Silt	yes	Frozen
173.33	173.37	Outwash	Flat to rolling		1	0.5		Poorly Graded Gravel w Silt to Silty Gravel	no	4
173.37	173.46	Outwash	Flat to rolling		2	0.5		Peat/OL over Silty Sand/Sandy Silt over Poorly Graded Gravel w Silt	yes	Frozen

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground
Start	End	Landform			1	0.5	Poorly Graded Gravel w Silt to Silty Gravel	no	4
173.46	173.47	Outwash	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt over Poorly Graded Gravel w Silt	yes	Frozen
173.47	173.59	Outwash	Flat to rolling		1	0.5	Poorly Graded Gravel w Silt to Silty Gravel	no	4
173.59	173.6	Outwash	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt over Poorly Graded Gravel w Silt	yes	Frozen
173.6	173.61	Outwash	Flat to rolling		1	0.5	Poorly Graded Gravel w Silt to Silty Gravel	no	4
173.61	173.62	Outwash	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt over Poorly Graded Gravel w Silt	yes	Frozen
173.62	173.67	Outwash	Flat to rolling		1	0.5	Poorly Graded Gravel w Silt to Silty Gravel	no	4
173.67	173.69	Outwash	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt over Poorly Graded Gravel w Silt	yes	Frozen
173.69	173.75	Outwash	Flat to rolling		1	0.5	Poorly Graded Gravel w Silt to Silty Gravel	no	4
173.75	173.76	Outwash	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt over Poorly Graded Gravel w Silt	yes	Frozen
173.76	173.84	Outwash	Flat to rolling		1	0.5	Poorly Graded Gravel w Silt to Silty Gravel	no	4
173.84	173.97	Outwash	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt over Poorly Graded Gravel w Silt	yes	Frozen
173.97	174.15	Outwash fan	Flat	GP-236	0.25	0.25	Poorly Graded Gravel to Poorly Graded Gravel w Silt	no	4
174.15	174.25	Alluvium/active channel	Flat		0	0	Poorly Graded Gravel to Poorly Graded Gravel w Silt	no	2
174.25	174.68	Outwash fan	Flat		0.25	0.25	Poorly Graded Gravel to Poorly Graded Gravel w Silt	no	4
174.68	174.96	Reworked moraine	Flat to rolling		0.25	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
174.96	175.01	Reworked moraine	Flat to rolling		0.25	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
175.01	175.03	Reworked moraine	Flat to rolling		0.25	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
175.03	175.14	Reworked moraine	Flat to rolling	GP-237	0.25	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
175.14	175.2	Reworked moraine	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
175.2	175.36	Reworked moraine	Flat to rolling		7	7	Peat/OL	yes	Frozen

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground
Start	End	Landform							
175.36	175.38	Reworked moraine	Flat to rolling		4	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
175.38	175.41	Reworked moraine	Flat to rolling		7	7	Peat/OL	yes	Frozen
175.41	175.41	Reworked moraine	Flat to rolling		4	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
175.41	175.45	Reworked moraine	Flat to rolling		7	7	Peat/OL	yes	Frozen
175.45	175.45	Reworked moraine	Flat to rolling		4	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
175.45	175.56	Reworked moraine	Flat to rolling	GP-238	7	7	Peat/OL	yes	Frozen
175.56	175.57	Reworked moraine	Flat to rolling		4	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
175.57	175.7	Reworked moraine	Flat to rolling		7	7	Peat/OL	yes	Frozen
175.7	175.74	Reworked moraine	Flat to rolling		4	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
175.74	175.78	Reworked moraine	Flat to rolling		7	7	Peat/OL	yes	Frozen
175.78	175.81	Reworked moraine	Flat to rolling		4	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
175.81	175.87	Reworked moraine	Flat to rolling		7	7	Peat/OL	yes	Frozen
175.87	175.88	Reworked moraine	Flat to rolling		4	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
175.88	176.05	Reworked moraine, boggy	Flat to rolling	GP-239	2	0.25	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
176.05	176.06	Outwash	Flat to rolling		0.25	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	Frozen
176.06	176.11	Outwash	Flat to rolling		0.25	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
176.11	176.21	Outwash	Flat to rolling		2	0.25	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
176.21	176.26	Outwash	Flat to rolling		0.25	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
176.26	176.28	Outwash	Flat to rolling		2	0.25	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
176.28	176.38	Outwash	Flat to rolling		0.25	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
176.38	176.41	Outwash	Flat to rolling		2	0.25	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
176.41	176.43	Outwash	Flat to rolling		0.25	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
176.43	176.46	Outwash	Flat to rolling		2	0.25	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
176.46	176.54	Outwash	Flat to rolling		0.25	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
176.54	176.57	Outwash	Flat to rolling		2	0.25	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-Frozen
Start	End	Landform							
176.57	176.59	Outwash	Flat to rolling		0.25	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	
176.59	176.6	Outwash	Flat to rolling		2	0.25	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
176.6	176.65	Outwash	Flat to rolling		0.25	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
176.65	176.65	Outwash	Flat to rolling		2	0.25	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
176.65	176.79	Outwash fan	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	5
176.79	176.84	Alluvial terrace	Flat	GP-240	1	0.25	Silty Sand w Gravel to Silty Gravel	no	5
176.84	176.91	Alluvium/active channel	Flat		0.25	0.25	Poorly Graded Gravel w Silt	no	2
176.91	176.94	Alluvial terrace	Flat		1	0.25	Silty Sand w Gravel to Silty Gravel	no	5
176.94	177.34	Outwash fan	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
177.34	177.35	Outwash	Flat to rolling		0.5	0.5	Ice-rich Sandy Silt w Gravel over Silty Sand w Gravel	no	4
177.35	177.42	Outwash	Flat to rolling		0.5	0.5	Ice-rich Sandy Silt w Gravel over Silty Sand w Gravel	yes	Frozen
177.42	177.47	Outwash	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
177.47	177.58	Outwash	Flat to rolling		0.5	0.5	Ice-rich Sandy Silt w Gravel over Silty Sand w Gravel	yes	Frozen
177.58	177.59	Outwash	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
177.59	177.63	Outwash	Flat to rolling		0.5	0.5	Ice-rich Sandy Silt w Gravel over Silty Sand w Gravel	yes	Frozen
177.63	177.71	Outwash	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
177.71	177.75	Outwash	Flat to rolling		0.5	0.5	Ice-rich Sandy Silt w Gravel over Silty Sand w Gravel	yes	Frozen
177.75	177.76	Outwash	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
177.76	177.78	Outwash	Flat to rolling		0.5	0.5	Ice-rich Sandy Silt w Gravel over Silty Sand w Gravel	yes	Frozen
177.78	177.82	Outwash	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
177.82	177.89	Outwash	Flat to rolling	GP-241	0.5	0.5	Ice-rich Sandy Silt w Gravel over Silty Sand w Gravel	yes	Frozen
177.89	177.9	Outwash	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-Frozen
Start	End	Landform							
177.9	177.97	Outwash	Flat to rolling		0.5	0.5	Ice-rich Sandy Silt w Gravel over Silty Sand w Gravel	yes	
177.97	178.02	Outwash	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
178.02	178.08	Outwash	Flat to rolling		0.5	0.5	Ice-rich Sandy Silt w Gravel over Silty Sand w Gravel	yes	Frozen
178.08	178.11	Outwash	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
178.11	178.18	Outwash	Flat to rolling		0.5	0.5	Ice-rich Sandy Silt w Gravel over Silty Sand w Gravel	yes	Frozen
178.18	178.25	Outwash	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
178.25	178.35	Outwash	Flat to rolling		0.5	0.5	Ice-rich Sandy Silt w Gravel over Silty Sand w Gravel	yes	Frozen
178.35	178.36	Outwash	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
178.36	178.4	Outwash	Flat to rolling		0.5	0.5	Ice-rich Sandy Silt w Gravel over Silty Sand w Gravel	yes	Frozen
178.4	178.45	Outwash	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
178.45	178.5	Outwash	Flat to rolling		0.5	0.5	Ice-rich Sandy Silt w Gravel over Silty Sand w Gravel	yes	Frozen
178.5	178.57	Outwash	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
178.57	178.59	Outwash	Flat to rolling		0.5	0.5	Ice-rich Sandy Silt w Gravel over Silty Sand w Gravel	yes	Frozen
178.59	178.6	Outwash	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
178.6	178.92	Outwash fan	Flat to rolling	GP-242	1.5	1	Poorly Graded Gravel w Silt to Silty Gravel	no	>10
178.92	178.99	Outwash fan	Flat to rolling		1.5	1	Poorly Graded Gravel w Silt to Silty Gravel	no	>10
178.99	179.13	Outwash fan	Flat to rolling		1.5	1	Poorly Graded Gravel w Silt to Silty Gravel	no	4
179.13	179.27	Alluvium	Flat		0.5	0.5	Poorly Graded Gravel to Poorly Graded Gravel w Silt	no	2
179.27	179.28	Outwash	Flat to rolling		0.5	0.5	Sandy Lean Clay w Gravel to Silty Gravel	no	4
179.28	179.53	Outwash	Flat to rolling		0.5	0.5	Ice-rich Sandy Lean Clay w Gravel to Silty Gravel	yes	Frozen
179.53	179.56	Outwash	Flat to rolling		0.5	0.5	Sandy Lean Clay w Gravel to Silty Gravel	no	4
179.56	179.63	Outwash	Flat to rolling		0.5	0.5	Ice-rich Sandy Lean Clay w Gravel to Silty Gravel	yes	Frozen

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground
Start	End	Landform							
179.63	179.64	Outwash	Flat to rolling		0.5	0.5	Sandy Lean Clay w Gravel to Silty Gravel	no	4
179.64	179.84	Outwash	Flat to rolling	GP-243; GP-244	0.5	0.5	Ice-rich Sandy Lean Clay w Gravel to Silty Gravel	yes	Frozen
179.84	179.88	Outwash	Flat to rolling		0.5	0.5	Sandy Lean Clay w Gravel to Silty Gravel	no	4
179.88	180.1	Outwash	Flat to rolling		0.5	0.5	Ice-rich Sandy Lean Clay w Gravel to Silty Gravel	yes	Frozen
180.1	180.26	Outwash	Flat to rolling		0.5	0.5	Sandy Lean Clay w Gravel to Silty Gravel	no	4
180.26	180.29	Outwash	Flat to rolling		0.5	0.5	Ice-rich Sandy Lean Clay w Gravel to Silty Gravel	yes	Frozen
180.29	180.37	Outwash	Flat to rolling		0.5	0.5	Sandy Lean Clay w Gravel to Silty Gravel	no	4
180.37	180.46	Alluvium	Flat		0.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	no	2
180.46	180.51	Outwash	Flat to rolling		0.5	0.5	Sandy Lean Clay w Gravel to Silty Gravel	no	Frozen
180.51	180.51	Outwash	Flat to rolling		0.5	0.5	Ice-rich Sandy Lean Clay w Gravel to Silty Gravel	yes	5
180.51	180.6	Outwash	Flat to rolling		0.5	0.5	Sandy Lean Clay w Gravel to Silty Gravel	no	Frozen
180.6	180.63	Outwash	Flat to rolling		0.5	0.5	Ice-rich Sandy Lean Clay w Gravel to Silty Gravel	yes	5
180.63	180.65	Outwash	Flat to rolling		0.5	0.5	Sandy Lean Clay w Gravel to Silty Gravel	no	Frozen
180.65	180.69	Outwash	Flat to rolling		0.5	0.5	Ice-rich Sandy Lean Clay w Gravel to Silty Gravel	yes	5
180.69	180.69	Outwash	Flat to rolling		0.5	0.5	Sandy Lean Clay w Gravel to Silty Gravel	no	Frozen
180.69	180.74	Outwash	Flat to rolling		0.5	0.5	Ice-rich Sandy Lean Clay w Gravel to Silty Gravel	yes	5
180.74	180.76	Outwash	Flat to rolling		0.5	0.5	Sandy Lean Clay w Gravel to Silty Gravel	no	Frozen
180.76	180.78	Alluvium/reworked till	Flat to rolling		1.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
180.78	180.8	Outwash	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	Frozen
180.8	180.85	Outwash	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	5
180.85	180.88	Outwash	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	Frozen
180.88	180.89	Alluvium/outwash	Flat to rolling		1	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground
Start	End	Landform							
180.89	180.95	Outwash	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
180.95	180.97	Outwash	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
180.97	181	Outwash	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
181	181.02	Alluvium/outwash	Flat to rolling		1	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
181.02	181.06	Outwash	Flat to rolling		1.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
181.06	181.09	Outwash	Flat to rolling		0.5	0.25	Ice-rich Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
181.09	181.12	Outwash	Flat to rolling		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
181.12	181.13	Alluvium/outwash	Flat to rolling		1	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
181.13	181.13	Outwash	Flat to rolling		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
181.13	181.16	Outwash	Flat to rolling		0.5	0.25	Ice-rich Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
181.16	181.17	Outwash	Flat to rolling		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
181.17	181.19	Outwash	Flat to rolling		0.5	0.25	Ice-rich Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
181.19	181.2	Outwash	Flat to rolling		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
181.2	181.25	Outwash	Flat to rolling		0.5	0.25	Ice-rich Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
181.25	181.26	Outwash	Flat to rolling		1.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
181.26	181.28	Alluvium/outwash	Flat to rolling		1	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
181.28	181.3	Outwash	Flat to rolling		1.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
181.3	181.33	Outwash	Flat to rolling		0.5	0.25	Ice-rich Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
181.33	181.34	Outwash	Flat to rolling		1.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
181.34	181.36	Alluvium/outwash	Flat to rolling		1	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
181.36	181.36	Outwash	Flat to rolling		1.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
181.36	181.43	Outwash	Flat to rolling	GP-245	0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
181.43	181.46	Outwash	Flat to rolling		1.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
181.46	181.48	Alluvium/outwash	Flat to rolling		1	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
181.48	181.5	Outwash	Flat to rolling		1.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
181.5	181.55	Outwash	Flat to rolling		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
181.55	181.56	Outwash	Flat to rolling		1.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
181.56	181.58	Alluvium/outwash	Flat to rolling		1	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
181.58	181.59	Outwash	Flat to rolling		1.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
181.59	181.61	Outwash	Flat to rolling		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
181.61	181.65	Outwash	Flat to rolling		1.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
181.65	181.68	Outwash	Flat to rolling		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
181.68	181.7	Outwash	Flat to rolling		1.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
181.7	181.76	Alluvium/outwash	Flat to rolling		1	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
181.76	181.83	Outwash	Flat to rolling		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
181.83	181.85	Outwash	Flat to rolling		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
181.85	181.85	Outwash	Flat to rolling		1.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
181.85	182.82	Ice-contact deposits	Flat to rolling	GP-246	0.5	0.25	Clayey Sand w Gravel to Silty Gravel	no	4
182.82	183.22	Alluvium	Flat	GP-247	0.25	0.25	Poorly Graded Gravel w Silt	no	2
183.22	183.23	Outwash fan	Flat to rolling		2	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
183.23	183.28	Outwash fan	Flat to rolling	GP-248	2	1	Ice-rich Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
183.28	183.31	Outwash fan	Flat to rolling		2	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
183.31	183.35	Outwash fan	Flat to rolling		2	1	Ice-rich Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
183.35	183.37	Outwash fan	Flat to rolling		2	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-Frozen
Start	End	Landform							
183.37	183.47	Outwash fan	Flat to rolling		0.7	0.5	Ice-rich Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	
183.47	183.5	Outwash fan	Flat to rolling		2	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
183.5	183.58	Outwash fan	Flat to rolling	GP-249	0.7	0.5	Ice-rich Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
183.58	183.59	Outwash fan	Flat to rolling		2	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
183.59	183.66	Outwash fan	Flat to rolling		0.7	0.5	Ice-rich Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
183.66	183.67	Outwash fan	Flat to rolling		2	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
183.67	183.67	Outwash fan	Flat to rolling		0.7	0.5	Ice-rich Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
183.67	183.68	Outwash fan	Flat to rolling		2	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
183.68	183.75	Outwash fan	Flat to rolling		0.7	0.5	Ice-rich Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
183.75	183.76	Outwash fan	Flat to rolling		2	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
183.76	183.77	Outwash fan	Flat to rolling		0.7	0.5	Ice-rich Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
183.77	183.8	Outwash fan	Flat to rolling		2	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
183.8	183.82	Reworked moraine	Flat to rolling		0.7	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	5
183.82	183.95	Reworked moraine	Flat to rolling		0.7	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
183.95	183.97	Reworked moraine	Flat to rolling		0.7	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	3
183.97	184.05	Reworked moraine	Flat to rolling		0.7	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
184.05	184.09	Reworked moraine	Flat to rolling		2	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	4
184.09	184.12	Kettle and kame/reworked moraine	Flat to hummocky		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
184.12	184.36	Kettle and kame/reworked moraine	Flat to hummocky		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
184.36	184.38	Kettle and kame/reworked moraine	Flat to hummocky		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
184.38	184.47	Alluvium/active channel	Flat		0.25	0.25	Poorly Graded Gravel w Silt to Silty Gravel	no	2
184.47	184.5	Reworked moraine	Flat to rolling		0.7	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-Frozen
Start	End	Landform							
184.5	184.61	Reworked moraine	Flat to rolling		0.7	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	
184.61	184.78	Reworked moraine	Flat to rolling		2	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
184.78	184.87	Reworked moraine	Flat to rolling		0.7	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
184.87	185.03	Reworked moraine	Flat to rolling		2	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
185.03	185.18	Alluvium	Flat		2	0.5	Poorly Graded Gravel w Silt to Silty Gravel	no	>10
185.18	185.34	Alluvium/active channel	Flat		0.25	0.25	Poorly Graded Gravel w Silt to Silty Gravel	no	2
185.34	185.56	Alluvial terrace/reworked moraine	Flat to rolling		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
185.56	185.77	Terminal moraine/ice-contact	Flat to hummocky	GP-251	0.1	0.1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
185.77	185.8	Kettle and kame/moraine	Flat to hummocky	GP-252	3.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	0.5
185.8	185.81	Kettle and kame/moraine	Flat to hummocky		0.1	0.1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
185.81	185.85	Kettle and kame/moraine	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
185.85	185.88	Kettle and kame/moraine	Flat to hummocky		0.1	0.1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
185.88	185.91	Kettle and kame/moraine	Flat to hummocky		3.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	0.5
185.91	186.08	Kettle and kame/moraine	Flat to rolling	GP-253	1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
186.08	186.15	Kettle and kame/moraine	Flat to hummocky		3.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	0.5
186.15	186.18	Kettle and kame/moraine	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
186.18	186.27	Kettle and kame/moraine	Flat to hummocky		3.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	0.5
186.27	186.37	Kettle and kame/moraine	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
186.37	186.38	Kettle and kame/moraine	Flat to hummocky		3.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	0.5
186.38	186.39	Kettle and kame/moraine	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
186.39	186.46	Kettle and kame/moraine	Flat to hummocky		3.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	0.5
186.46	186.58	Kettle and kame/moraine	Flat to hummocky		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
186.58	186.61	Kettle and kame/moraine	Flat to hummocky		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
186.61	186.65	Kettle and kame/moraine	Flat to hummocky		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
186.65	186.66	Kettle and kame/moraine	Flat to hummocky		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
186.66	186.7	Kettle and kame/moraine	Flat to rolling	GP-254	5	1	Ice-rich Peat over Lean Clay w Sand	yes	Frozen
186.7	186.72	Kettle and kame/moraine	Flat to hummocky		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
186.72	186.74	Kettle and kame/moraine	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
186.74	186.77	Kettle and kame/moraine	Flat to hummocky		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
186.77	186.93	Kettle and kame/moraine	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
186.93	186.96	Kettle and kame/moraine	Flat to hummocky		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
186.96	187.1	Kettle and kame/moraine	Flat to hummocky		5	0.25	Ice-rich Peat over Lean Clay w Sand	yes	Frozen
187.1	187.16	Kettle and kame/moraine	Flat to hummocky		3.5	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	0.5
187.16	187.17	Kettle and kame/moraine	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
187.17	187.19	Kettle and kame/moraine	Flat to hummocky		3.5	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	0.5
187.19	187.19	Kettle and kame/moraine	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
187.19	187.2	Kettle and kame/moraine	Flat to hummocky		3.5	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	0.5
187.2	187.26	Kettle and kame/moraine	Flat to rolling		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
187.26	187.3	Kettle and kame/moraine	Flat to hummocky	GP-255	3.5	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	0.5
187.3	187.38	Kettle and kame/moraine	Flat to rolling		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
187.38	187.41	Kettle and kame/moraine	Flat to hummocky		3.5	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	0.5
187.41	187.42	Kettle and kame/moraine	Flat to rolling		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
187.42	187.44	Kettle and kame/moraine	Flat to hummocky		3.5	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	0.5
187.44	187.45	Kettle and kame/moraine	Flat to hummocky		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
187.45	187.48	Kettle and kame/moraine	Flat to rolling		3.5	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	0.5
187.48	187.6	Kettle and kame/moraine	Flat to hummocky		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
187.6	187.6	Kettle and kame/moraine	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel	no	0.2
187.6	187.61	Kettle and kame/moraine	Flat to hummocky		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
187.61	187.62	Kettle and kame/moraine	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel	no	0.2
187.62	187.63	Kettle and kame/moraine	Flat to hummocky		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
187.63	187.66	Kettle and kame/moraine	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel	no	0.2
187.66	187.73	Kettle and kame/moraine	Flat to hummocky		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
187.73	187.79	Kettle and kame/moraine	Flat to rolling	GP-256	1	0.5	Silty Sand/Sandy Silt w Gravel	no	0.2
187.79	187.81	Kettle and kame/moraine	Flat to hummocky		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
187.81	187.82	Kettle and kame/moraine	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel	no	0.2
187.82	187.82	Kettle and kame/moraine	Flat to hummocky		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
187.82	188.12	Kettle and kame/moraine	Flat to hummocky		3	1	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	0.5
188.12	188.13	Kettle and kame/moraine	Flat to hummocky		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
188.13	188.18	Kettle and kame/moraine	Flat to hummocky		3	1	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	0.5
188.18	188.19	Kettle and kame/moraine	Flat to hummocky		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
188.19	188.24	Kettle and kame/moraine	Flat to hummocky		3	1	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	0.5
188.24	188.25	Kettle and kame/moraine	Flat to hummocky		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
188.25	188.25	Kettle and kame/moraine	Flat to hummocky		3	1	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	0.5
188.25	188.37	Reworked moraine	Flat to rolling		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
188.37	188.41	Reworked moraine, boggy	Flat		3	1	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	2
188.41	188.42	Reworked moraine	Flat to rolling		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
188.42	188.49	Peat bog/Reworked moraine	Flat	GP-257	3	1	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	2
188.49	188.5	Reworked moraine	Flat to rolling		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform			3	1	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	2
188.5	188.53	Reworked moraine, boggy	Flat		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
188.58	188.88	Reworked moraine	Flat to rolling		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
188.88	188.9	Alluvium/reworked till	Flat to rolling		1.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
188.9	189.52	Reworked moraine	Flat to rolling	GP-258	0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
189.52	189.54	Alluvium/reworked till	Flat to rolling		1.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
189.54	189.57	Reworked moraine	Flat to rolling		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
189.57	189.57	Peat bog	Flat		10	1	Peat/OL	no	0.5
189.57	191.08	Reworked moraine	Flat to rolling		0.5	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
191.08	191.13	Alluvial terrace	Flat to rolling		1	0.25	Poorly Graded Gravel w Silt to Silty Gravel	no	>10
191.13	191.86	Alluvium/active channel	Flat	GP-260	0	0	Poorly Graded Gravel to Poorly Graded Gravel w Silt	no	0.5
191.86	191.88	Peat bog/alluvium	Flat	GP-261	2	1	Peat/PL over Silty Sand w Gravel	no	4
191.88	192.25	Alluvial terrace	Flat		0.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	no	>10
192.25	192.3	Bog	Flat		10	1	Peat/OL	no	0
192.3	192.31	Alluvial terrace	Flat		0.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	no	>10
192.31	192.35	Reworked moraine	Hilly		0.5	0.5	Poorly Graded Gravel w Silt to Silty Gravel	no	>10
192.35	193	Reworked moraine	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
193	193.06	Alluvium/reworked moraine	Flat to rolling		1	0.25	Poorly Graded Gravel w Silt to Silty Gravel	no	>10
193.06	193.18	Reworked moraine	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
193.18	193.18	Reworked moraine, boggy	Flat to rolling		3	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
193.18	193.2	Reworked moraine, boggy	Flat to rolling	GP-262	0.5	0.5	Ice-rich Sandy Silt/Sandy Clay	yes	Frozen
193.2	193.24	Reworked moraine, boggy	Flat to rolling		3	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
193.24	193.32	Reworked moraine, boggy	Flat to rolling		0.5	0.5	Ice-rich Sandy Silt/Sandy Clay	yes	Frozen
193.32		Reworked moraine, boggy	Flat to rolling		3	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
193.33	193.42	Reworked moraine	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
193.42	193.43	Bog	Flat		10	1	Peat/OL	no	0
193.43	193.72	Reworked moraine	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
193.72	193.87	Reworked moraine, boggy	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	1
193.87	193.88	Alluvium/reworked till	Flat to rolling		1.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
193.88	194	Reworked moraine, boggy	Flat to rolling	GP-263	1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	1
194	194	Alluvium/reworked till	Flat to rolling		1.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
194	194.04	Reworked moraine, boggy	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	1
194.04	194.08	Alluvium/reworked till	Flat to rolling		1.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
194.08	194.22	Reworked moraine, boggy	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	1
194.22	194.35	Outwash/reworked moraine, boggy	Flat to rolling		1	0.5	Poorly Graded Gravel w Silt to Silty Gravel	no	2
194.35	194.39	Reworked moraine	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
194.39	194.52	Outwash/reworked moraine, boggy	Flat to rolling		1	0.5	Poorly Graded Gravel w Silt to Silty Gravel	no	2
194.52	194.53	Reworked moraine	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
194.53	194.78	Reworked moraine	Flat to rolling		0.5	0.5	Ice-rich Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
194.78	194.78	Reworked moraine	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
194.78	194.81	Outwash	Flat to rolling		1	0.5	Poorly Graded Gravel w Silt to Silty Gravel	no	4
194.81	194.82	Till	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
194.82	194.97	Till	Flat to rolling		0.5	0.5	Ice-rich Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
194.97	194.97	Till	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
194.97	195	Ice-contact deposits	Hummocky		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
195	195.02	Alluvium/reworked till	Flat to rolling		1.5	1	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
195.02	195.13	Till	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
195.13	195.23	Till	Flat to rolling	GP-264	1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
195.23	195.23	Till	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
195.23	195.25	Ice-contact deposits	Hummocky		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	3
195.25	195.32	Alluvium/reworked outwash	Flat to rolling		0.25	0.25	Poorly Graded Gravel w Silt to Silty Gravel	no	2
195.32	195.34	Ice-contact deposits	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
195.34	195.34	Reworked moraine/Till	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
195.34	195.45	Reworked moraine/Till	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
195.45	195.46	Reworked moraine/Till	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
195.46	195.52	Reworked moraine/Till	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
195.52	195.53	Reworked moraine/Till	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
195.53	195.54	Ice-contact deposits	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
195.54	195.61	Reworked moraine/Till	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
195.61	195.66	Reworked moraine/Till	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
195.66	195.67	Reworked moraine/Till	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
195.67	195.69	Ice-contact deposits	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
195.69	195.75	Reworked moraine/Till	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
195.75	195.95	Ice-contact deposits	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
195.95	195.97	Reworked moraine/Esker	Flat to rolling		0.5	0.5	Silty Sand/Sandy Silt tr Gravel	no	>10
195.97	196	Reworked moraine/Till	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
196	196	Reworked moraine/Till	Flat to rolling		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
196	196.12	Kettle and kame/moraine/esker/Till	Flat to rolling	GP-265	0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
196.12	196.13	Peat bog	Flat		10	1	Peat/OL	no	1

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground
Start	End	Landform							
196.13	196.22	Kettle and kame/moraine/esker/Till	Hummocky		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
196.22	196.23	Ice-contact deposits, boggy	Hummocky		2	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
196.23	196.24	Kettle and kame/moraine/esker/Till	Hummocky		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
196.24	196.26	Ice-contact deposits, boggy	Hummocky		2	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
196.26	196.64	Kettle and kame/moraine/esker/Till	Hummocky		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
196.64	196.68	Ice-contact deposits, boggy	Hummocky		2	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
196.68	197.52	Kettle and kame/moraine/esker/Till	Hummocky	GP-266; GP-267	0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
197.52	197.58	Ice-contact deposits, boggy	Hummocky		2	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
197.58	197.79	Kettle and kame/moraine/esker/Till	Hummocky		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
197.79	197.81	Ice-contact deposits, boggy	Hummocky		2	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
197.81	198.09	Kettle and kame/moraine/esker/Till	Hummocky		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
198.09	198.21	Ice-contact deposits/Outwash, boggy	Hummocky	GP-268	2.5	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	1
198.21	198.25	Ice-contact deposits, boggy	Hummocky		2	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
198.25	198.28	Ice-contact deposits, boggy	Hummocky		2	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
198.28	198.33	Terminal moraine	Hummocky	GP-269	0.25	0.25	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	5
198.33	198.39	Reworked moraine/Till	Rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
198.39	198.42	Reworked moraine/Till, boggy	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
198.42	198.62	Reworked moraine/Till	Rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	>10
198.62	198.64	Reworked moraine/Till, boggy	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
198.64	198.65	Peat bog	Flat		10	1	Peat/OL	no	1
198.65	198.65	Reworked moraine/Till, boggy	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
198.65	200.52	Reworked moraine/Till	Rolling	GP-270; GP-271	1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4

Pipeline Soil and Permafrost Data

130627 Milepost		Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-	
Start	End	Landform							
200.52	200.58	Reworked moraine/Till, boggy	Flat to rolling	2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2	
200.58	200.73	Reworked moraine/Till	Rolling	1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4	
200.73	200.81	Outwash/reworked till	Rolling	0.5	0.5	Silty Sand w Gravel	no	4	
200.81	200.91	Reworked moraine/Till	Rolling	1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4	
200.91	201.13	Reworked moraine/Till/Outwash,	Flat to rolling	GP-272	2.5	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
201.13	201.16	Peat bog, reworked moraine/till	Flat		4	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	1
201.16	201.36	Reworked moraine/Till/Outwash,	Flat to rolling		2.5	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
201.36	201.39	Peat bog, reworked moraine/till	Flat		4	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	1
201.39	201.52	Reworked moraine/Till, boggy	Rolling to Hummocky		2	1	Silty Sand/Sandy Silt tr Gravel	no	4
201.52	201.53	Reworked moraine/Till, boggy	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	yes	Frozen
201.53	201.59	Reworked moraine/Till, boggy	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	2
201.59	201.65	Reworked moraine/Till, boggy	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	yes	Frozen
201.65	201.67	Reworked moraine/Till, boggy	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	2
201.67	201.68	Reworked moraine/Till, boggy	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	yes	Frozen
201.68	201.71	Reworked moraine/Till, boggy	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	2
201.71	201.8	Reworked moraine/Till, boggy	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	yes	Frozen
201.8	201.81	Reworked moraine/Till, boggy	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	2
201.81	201.82	Peat bog	Flat		10	1	Peat/OL	no	1
201.82	201.84	Reworked moraine/Till, boggy	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	2
201.84	201.85	Peat bog	Flat		10	1	Peat/OL	no	1
201.85	201.86	Reworked moraine/Till, boggy	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	2
201.86	201.88	Peat bog	Flat		10	1	Peat/OL	no	1
201.88	201.89	Reworked moraine/Till, boggy	Flat to rolling		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	2
201.89	201.9	Reworked moraine/Till, boggy	Flat to rolling		1	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	yes	Frozen

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform			2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	2
201.9	201.91	Reworked moraine/Till, boggy	Flat to rolling		6	1	Peat/OL	no	1
201.95	201.95	Reworked moraine/till	Flat to Hummocky		2	1	Silty Sand/Sandy Clay/Silt tr Gravel	no	4
201.95	202.03	Reworked moraine/till	Rolling to Hummocky		0.5	0.5	Silty Sand/Sandy Clay/Silt tr Gravel	yes	Frozen
202.03	202.03	Reworked moraine/till	Rolling to Hummocky	GP-273	2	1	Silty Sand/Sandy Clay/Silt tr Gravel	no	4
202.03	202.05	Peat bog	Flat		6	1	Peat/OL	no	1
202.05	202.06	Reworked moraine/Till, boggy	Flat		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	2
202.06	202.07	Peat bog	Flat	GP-273	8	1	Peat/OL	no	1
202.07	202.13	Peat bog	Flat		6	1	Peat/OL	no	1
202.13	202.16	Peat bog	Flat		8	1	Peat/OL	no	1
202.16	202.17	Reworked moraine/till	Rolling to Hummocky		1	0.5	Silty Sand/Sandy Clay/Silt tr Gravel	no	4
202.17	202.21	Reworked moraine/till	Rolling to Hummocky		0.5	0.5	Silty Sand/Sandy Clay/Silt tr Gravel	yes	Frozen
202.21	202.28	Reworked moraine/till	Rolling to Hummocky		1	0.5	Silty Sand/Sandy Clay/Silt tr Gravel	no	4
202.28	202.33	Reworked moraine/till	Rolling to Hummocky		0.5	0.5	Silty Sand/Sandy Clay/Silt tr Gravel	yes	Frozen
202.33	202.38	Reworked moraine/till	Rolling to Hummocky		1	0.5	Silty Sand/Sandy Clay/Silt tr Gravel	no	4
202.38	202.45	Reworked moraine/Till, boggy	Flat		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	2
202.45	202.46	Reworked moraine/till	Rolling to Hummocky		1	0.5	Silty Sand/Sandy Clay/Silt tr Gravel	no	4
202.46	202.71	Reworked moraine/till	Rolling to Hummocky		0.5	0.5	Silty Sand/Sandy Clay/Silt tr Gravel	yes	Frozen
202.71	202.8	Reworked moraine/till	Rolling to Hummocky		1	0.5	Silty Sand/Sandy Clay/Silt tr Gravel	no	4
202.8	202.81	Reworked moraine/till	Rolling to Hummocky		0.5	0.5	Silty Sand/Sandy Clay/Silt tr Gravel	yes	Frozen
202.81	202.9	Reworked moraine/till	Rolling to Hummocky		1	0.5	Silty Sand/Sandy Clay/Silt tr Gravel	no	4
202.9	202.93	Reworked moraine/Till, boggy	Flat		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	2
202.93	202.95	Reworked moraine/till	Rolling to Hummocky		1	0.5	Silty Sand/Sandy Clay/Silt tr Gravel	no	4
202.95	202.98	Reworked moraine/Till, boggy	Flat		2	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	2
202.98	203.06	Reworked moraine/till	Flat to rolling		0.5	0.5	Silt tr Sand	no	4

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description	Boring/Geoprobe Locations	Peat/ Muskeg			Perma-frost (yes/no)	Average Depth to Ground
Start	End	Landform	(topography)		Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone		
203.06	203.06	Reworked moraine/till	Flat to rolling		1	0.5	Silt tr Sand	yes	Frozen
203.06	203.07	Reworked moraine/till	Flat to rolling		0.5	0.5	Silt tr Sand	no	4
203.07	203.08	Reworked moraine/till	Flat to rolling		1	0.5	Silt tr Sand	yes	Frozen
203.08	203.09	Reworked moraine/till	Flat to rolling		0.5	0.5	Silt tr Sand	no	4
203.09	203.11	Reworked moraine/till, boggy	Flat to rolling		2	0.5	Peat/OL over Silt to Sandy Silt	yes	Frozen
203.11	203.15	Reworked moraine/till, boggy	Flat to rolling		2	0.5	Peat/OL over Silt to Sandy Silt	no	2
203.15	203.18	Reworked moraine/till	Flat to rolling		1	0.5	Silt tr Sand	yes	Frozen
203.18	203.19	Reworked moraine/till	Flat to rolling		0.5	0.5	Silt tr Sand	no	4
203.19	203.22	Reworked moraine/till	Flat to rolling		1	0.5	Silt tr Sand	yes	Frozen
203.22	203.24	Reworked moraine/till	Flat to rolling		0.5	0.5	Silt tr Sand	no	4
203.24	203.24	Reworked moraine/till	Flat to rolling		1	0.5	Silt tr Sand	yes	Frozen
203.24	203.24	Reworked moraine/till	Flat to rolling		0.5	0.5	Silt tr Sand	no	4
203.24	203.28	Peat bog	Flat		8	1	Peat/OL	no	1
203.28	203.28	Reworked moraine/till	Flat to rolling		0.5	0.5	Silt tr Sand	no	4
203.28	203.32	Reworked moraine/Till/Outwash	Flat to rolling	GP-274	1	0.5	Silt tr Sand	yes	Frozen
203.32	203.33	Reworked moraine/Till/Outwash	Flat to rolling		0.5	0.5	Silt tr Sand	no	2
203.33	203.35	Peat bog	Flat		8	1	Peat/OL	no	1
203.35	203.39	Reworked moraine/till, boggy	Rolling to Hummocky		2	1	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	2
203.39	203.4	Reworked moraine/till, boggy	Rolling to Hummocky		2	1	Peat/OL over Silty Sand/Sandy Silt w Gravel	yes	Frozen
203.4	203.4	Reworked moraine/till, boggy	Rolling to Hummocky		2	1	Peat/OL over Silty Sand/Sandy Silt w Gravel	no	2
203.4	203.41	Peat bog	Flat		8	1	Peat/OL	no	1
203.41	203.41	Reworked moraine/till	Flat to rolling		0.5	0.5	Sandy Silt tr Gravel	no	4
203.41	203.42	Reworked moraine/till	Flat to rolling		0.5	0.5	Sandy Silt tr Gravel	yes	Frozen
203.42	203.45	Reworked moraine/till	Flat to rolling		0.5	0.5	Sandy Silt tr Gravel	no	4
203.45	203.57	Reworked moraine/till	Flat to rolling		0.5	0.5	Sandy Silt tr Gravel	yes	Frozen
203.57	203.58	Reworked moraine/till	Flat to rolling		0.5	0.5	Sandy Silt tr Gravel	no	4
203.58	203.62	Reworked moraine/till	Flat to rolling		0.5	0.5	Sandy Silt tr Gravel	yes	Frozen
203.62	203.63	Reworked moraine/till	Flat to rolling		0.5	0.5	Sandy Silt tr Gravel	no	4
203.63	203.65	Reworked moraine/till	Flat to rolling		0.5	0.5	Sandy Silt tr Gravel	yes	Frozen
203.65	203.67	Reworked moraine/till	Flat to rolling		0.5	0.5	Sandy Silt tr Gravel	no	4
203.67	203.69	Peat bog	Flat		8	1	Peat/OL	no	1
203.69	203.7	Reworked moraine/till	Flat to rolling	GP-275	0.5	0.5	Sandy Silt tr Gravel	no	4
203.7	203.92	Reworked moraine/till	Flat to rolling		0.5	0.5	Sandy Silt tr Gravel	yes	Frozen
203.92	203.92	Reworked moraine/till	Flat to rolling		0.5	0.5	Sandy Silt tr Gravel	no	4
203.92	204.1	Reworked moraine/Till/Outwash,	Flat to Rolling		3	1		no	1

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)		Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform			0.5	0.5				
204.1	204.18	Alluvium/outwash	Flat					Silty Sand w Gravel to Silty Gravel	no	1
204.18	204.32	Reworked moraine/Till/Outwash,	Flat to Rolling		3	1		Peat/PL over Sandy Clay/Sandy Silt w Gravel	no	1
204.32	204.34	Reworked moraine/till	Flat to Rolling		0.5	0.5		Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	3
204.34	204.99	Reworked moraine/till	Flat to Rolling	GP-276	0.5	0.5		Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
204.99	205.02	Reworked moraine/till	Flat to Rolling		0.5	0.5		Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	3
205.02	205.05	Reworked moraine/till	Flat to Rolling		0.5	0.5		Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
205.05	205.05	Reworked moraine/till	Flat to Rolling		0.5	0.5		Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	3
205.05	205.14	Alluvium/colluvium	Rolling		0.5	0.5		Silty Sand w Gravel to Silty Gravel	no	3
205.14	205.17	Alluvium/outwash	Flat		0.5	0.5		Silty Sand w Gravel to Silty Gravel	no	3
205.17	205.19	Peat bog	Flat		8	1		Peat/OL	no	1
205.19	205.21	Alluvium/outwash	Flat	GP-277	0.5	0.5		Silty Sand w Gravel to Silty Gravel	no	3
205.21	205.24	Peat bog	Flat		8	1		Peat/OL	no	1
205.24	205.37	Alluvium/active channel/outwash	Flat		0.5	0.5		Poorly Graded Sand w Silt to Poorly Graded Gravel w Silt	no	1
205.37	205.38	Reworked moraine/till, boggy	Flat		3	1		Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
205.38	205.42	Reworked moraine/till/outwash	Flat		1	1		Silty Sand w Gravel to Silty Gravel	no	3
205.42	205.44	Peat bog	Flat		8	1		Peat/OL	no	1
205.44	205.46	Reworked moraine/till	Flat to Rolling		0.5	0.5		Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	3
205.46	205.48	Peat bog	Flat		8	1		Peat/OL	no	1
205.48	205.52	Reworked moraine/till	Flat to Rolling		0.5	0.5		Silty Sand/Sandy Silt tr Gravel	no	3
205.52	205.53	Peat bog	Flat		8	1		Peat/OL	no	1
205.53	205.58	Reworked moraine/till	Flat to Rolling		0.5	0.5		Silty Sand/Sandy Silt tr Gravel	no	3
205.58	205.59	Peat bog	Flat		8	1		Peat/OL	no	1
205.59	205.59	Reworked till/colluvium	Rolling		1	1		Silty Sand/Sandy Silt tr Gravel	no	3
205.59	205.63	Reworked till/colluvium	Rolling		1	1		Silty Sand/Sandy Silt tr Gravel	yes	Frozen
205.63	205.64	Reworked till/colluvium	Rolling		1	1		Silty Sand/Sandy Silt tr Gravel	no	3
205.64	205.65	Reworked till/colluvium	Rolling		1	1		Silty Sand/Sandy Silt tr Gravel	yes	Frozen
205.65	205.66	Reworked till/colluvium	Rolling		1	1		Silty Sand/Sandy Silt tr Gravel	no	3
205.66	205.72	Reworked till/colluvium	Rolling		1	1		Silty Sand/Sandy Silt tr Gravel	yes	Frozen

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
205.72	205.73	Reworked till/colluvium	Rolling		1	1	Silty Sand/Sandy Silt tr Gravel	no	3
205.73	205.74	Reworked till/colluvium	Rolling		1	1	Silty Sand/Sandy Silt tr Gravel	yes	Frozen
205.74	205.75	Reworked till/colluvium	Rolling		1	1	Silty Sand/Sandy Silt tr Gravel	no	3
205.75	205.76	Reworked till/colluvium	Rolling		1	1	Silty Sand/Sandy Silt tr Gravel	yes	Frozen
205.76	205.77	Reworked till/colluvium	Rolling		1	1	Silty Sand/Sandy Silt tr Gravel	no	3
205.77	205.82	Reworked till/colluvium	Rolling		1	1	Silty Sand/Sandy Silt tr Gravel	yes	Frozen
205.82	205.84	Reworked till/colluvium	Rolling		1	1	Silty Sand/Sandy Silt tr Gravel	no	3
205.84	206.09	Reworked till/colluvium	Rolling		1	1	Silty Sand/Sandy Silt tr Gravel	yes	Frozen
206.09	206.09	Reworked till/colluvium	Rolling		1	1	Silty Sand/Sandy Silt tr Gravel	no	3
206.09	206.1	Reworked till/colluvium	Flat to Rolling		3	1	Peat/OL over Silty Sand/Sandy Silt tr Gravel	no	2
206.1	206.1	Reworked till/colluvium	Rolling		1	1	Silty Sand/Sandy Silt tr Gravel	no	3
206.1	206.62	Reworked till/colluvium	Rolling		1	1	Silty Sand/Sandy Silt tr Gravel	yes	Frozen
206.62	206.62	Reworked till/colluvium	Rolling		1	1	Silty Sand/Sandy Silt tr Gravel	no	3
206.62	206.68	Peat bog	Flat		10	1	Peat/OL	no	0
206.68	206.68	Reworked till/colluvium	Flat to Rolling		1	0.5	Silty Sand/Sandy Silt tr Gravel	no	3
206.68	206.9	Reworked till/colluvium	Flat to Rolling	GP-278	1	0.5	Silty Sand/Sandy Silt tr Gravel	yes	Frozen
206.9	206.91	Reworked till/colluvium	Flat to Rolling		1	0.5	Silty Sand/Sandy Silt tr Gravel	no	3
206.91	206.94	Reworked till/colluvium	Flat to Rolling		1	0.5	Silty Sand/Sandy Silt tr Gravel	yes	Frozen
206.94	206.94	Reworked till/colluvium	Flat to Rolling		1	0.5	Silty Sand/Sandy Silt tr Gravel	no	3
206.94	206.94	Reworked till/colluvium	Flat to Rolling		3	1	Peat/OL over Silty Sand/Sandy Silt tr Gravel	no	2
206.94	206.95	Reworked till/colluvium	Flat to Rolling		1	0.5	Silty Sand/Sandy Silt tr Gravel	no	3
206.95	206.96	Reworked till/colluvium	Flat to Rolling		3	1	Peat/OL over Silty Sand/Sandy Silt tr Gravel	no	2
206.96	206.96	Reworked till/colluvium	Flat to Rolling		1	0.5	Silty Sand/Sandy Silt tr Gravel	no	3
206.96	206.97	Reworked till/colluvium	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	yes	Frozen
206.97	206.97	Reworked till/colluvium	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	no	3
206.97	206.98	Reworked till/colluvium	Flat to Rolling		3	1	Peat/OL over Silty Sand/Sandy Silt tr Gravel	no	2
206.98	206.98	Reworked till/colluvium	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	no	3
206.98	207.04	Reworked till/colluvium	Flat to Rolling	GP-279	0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	yes	Frozen

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)		Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform			0.5	0.5			no	3
207.04	207.05	Reworked till/colluvium	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel		yes	Frozen
207.05	207.07	Reworked till/colluvium	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel		no	3
207.07	207.08	Reworked till/colluvium	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel		yes	Frozen
207.08	207.09	Reworked till/colluvium	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel		no	3
207.09	207.09	Reworked till/colluvium	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel		yes	Frozen
207.09	207.1	Reworked till/colluvium	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel		no	3
207.1	207.1	Reworked till/colluvium	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel		yes	Frozen
207.1	207.14	Reworked till/colluvium	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel		no	3
207.14	207.14	Reworked till/colluvium	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel		yes	Frozen
207.14	207.3	Reworked till/colluvium	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel		no	3
207.3	207.31	Reworked till/colluvium	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel		yes	Frozen
207.31	207.37	Outwash	Flat to Rolling		1.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel		no	2
207.37	207.4	Peat bog	Flat		8	1	Peat/OL		no	0.5
207.4	207.41	Reworked till/Outwash	Flat to Rolling		1.5	0.5	Silty Sand/Sandy Silt tr Gravel		no	Frozen
207.41	207.44	Reworked till/Outwash	Flat to Rolling		1.5	0.5	Silty Sand/Sandy Silt tr Gravel		yes	Frozen
207.44	207.45	Reworked till/Outwash	Flat to Rolling		1.5	0.5	Silty Sand/Sandy Silt tr Gravel		no	Frozen
207.45	207.46	Peat bog	Flat		8	1	Peat/OL		no	0.5
207.46	207.48	Reworked till/Outwash	Flat to Rolling		1.5	0.5	Silty Sand/Sandy Silt tr Gravel		no	Frozen
207.48	207.49	Peat bog	Flat		8	1	Peat/OL		no	0.5
207.49	207.5	Reworked till/colluvium	Flat to Rolling		1	0.5	Sandy Clay/Sandy Silt tr Gravel		no	2
207.5	207.66	Reworked till/colluvium	Flat to Rolling		1	0.5	Sandy Clay/Sandy Silt tr Gravel		yes	Frozen
207.66	207.66	Reworked till/colluvium	Flat to Rolling		1	0.5	Sandy Clay/Sandy Silt tr Gravel		no	2
207.66	207.74	Reworked till/colluvium	Flat to Rolling		1	0.5	Sandy Clay/Sandy Silt tr Gravel		no	Frozen

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform			1	0.5	Sandy Clay/Sandy Silt tr Gravel	no	2
207.74	207.76	Reworked till/colluvium	Flat to Rolling		1	0.5	Sandy Clay/Sandy Silt tr Gravel	no	Frozen
207.76	207.82	Reworked till/colluvium	Flat to Rolling		1	0.5	Sandy Clay/Sandy Silt tr Gravel	no	Frozen
207.82	207.83	Reworked till/colluvium	Flat to Rolling		1	0.5	Sandy Clay/Sandy Silt tr Gravel	no	2
207.83	207.86	Reworked till/colluvium	Flat to Rolling		1	0.5	Sandy Clay/Sandy Silt tr Gravel	no	Frozen
207.86	207.86	Reworked till/colluvium	Flat to Rolling		1	0.5	Sandy Clay/Sandy Silt tr Gravel	no	2
207.86	207.88	Reworked till/colluvium	Flat to Rolling		1	0.5	Sandy Clay/Sandy Silt tr Gravel	no	Frozen
207.88	207.89	Reworked till/colluvium	Flat to Rolling		1	0.5	Sandy Clay/Sandy Silt tr Gravel	no	2
207.89	207.91	Reworked till/colluvium	Flat to Rolling		1	0.5	Sandy Clay/Sandy Silt tr Gravel	no	Frozen
207.91	207.92	Reworked till/colluvium	Flat to Rolling		1	0.5	Sandy Clay/Sandy Silt tr Gravel	no	2
207.92	207.99	Reworked till/colluvium	Flat to Rolling		1	0.5	Sandy Clay/Sandy Silt tr Gravel	no	Frozen
207.99	207.99	Reworked till/colluvium	Flat to Rolling		1	0.5	Sandy Clay/Sandy Silt tr Gravel	no	2
207.99	208.01	Colluvium/alluvium/reworked moraine	Flat		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
208.01	208.05	Reworked till/colluvium	Flat to Rolling		1	0.5	Sandy Clay/Sandy Silt tr Gravel	no	2
208.05	208.12	Reworked till/colluvium	Flat to Rolling		1	0.5	Sandy Clay/Sandy Silt tr Gravel	no	Frozen
208.12	208.13	Reworked till/colluvium	Flat to Rolling		1	0.5	Sandy Clay/Sandy Silt tr Gravel	no	2
208.13	208.21	Alluvium/reworked outwash	Flat to Rolling		1.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
208.21	208.24	Reworked outwash/till, boggy	Flat		2	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
208.24	208.29	Reworked outwash/till, boggy	Flat	GP-280	2	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	yes	Frozen
208.29	208.3	Reworked outwash/till, boggy	Flat		2	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
208.3	208.32	Alluvium/reworked outwash	Flat to Rolling		1.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
208.32	208.33	Till	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	no	2
208.33	208.46	Till	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	yes	Frozen

Pipeline Soil and Permafrost Data

130627 Milepost		Landform	Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg		Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground- 2
Start	End				Depth (ft)	Organic Mat Thickness (ft)			
208.46	208.47	Till	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	no	2
208.47	208.48	Till	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	yes	Frozen
208.48	208.5	Till	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	no	2
208.5	208.51	Till	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	yes	Frozen
208.51	208.53	Till	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	no	2
208.53	208.56	Till	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	yes	Frozen
208.56	208.57	Till	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	no	2
208.57	208.62	Till	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	yes	Frozen
208.62	208.63	Till	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	no	2
208.63	208.65	Till	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	yes	Frozen
208.65	208.66	Till	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	no	2
208.66	208.69	Till	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	yes	Frozen
208.69	208.69	Till	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	no	2
208.69	208.72	Reworked till/colluvium, boggy	Flat		2.5	0.5	Peat/OL over Sandy Clay/Sandy Silt tr Gravel	no	1
208.72	208.72	Till	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	no	2
208.72	208.73	Till	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	yes	Frozen
208.73	208.73	Till	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	no	2
208.73	208.74	Reworked till/colluvium, boggy	Flat		2.5	0.5	Peat/OL over Sandy Clay/Sandy Silt tr Gravel	no	1
208.74	208.74	Till	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	no	2
208.74	208.75	Till	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	yes	Frozen
208.75	208.77	Till	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	no	2
208.77	208.79	Till	Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	yes	Frozen

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform			0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	no	2
208.79	209 Till		Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	yes	Frozen
209	209.01 Till		Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	no	2
209.01	209.05 Till		Flat to Rolling		0.5	0.5	Sandy Clay/Sandy Silt tr Gravel	no	2
209.05	209.17 Reworked outwash/till, boggy	Flat			2	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
209.17	209.22 Reworked till	Rolling			1	1	Sandy Clay/Sandy Silt tr Gravel	no	1.5
209.22	209.23 Reworked till	Rolling			1	1	Sandy Clay/Sandy Silt tr Gravel	yes	Frozen
209.23	209.32 Reworked till	Rolling	GP-281		1	1	Sandy Clay/Sandy Silt tr Gravel	no	1.5
209.32	209.35 Reworked till	Rolling			1	1	Sandy Clay/Sandy Silt tr Gravel	yes	Frozen
209.35	209.42 Reworked till	Rolling			1	1	Sandy Clay/Sandy Silt tr Gravel	no	1.5
209.42	209.43 Outwash, boggy	Flat to rolling			2.5	1	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	1
209.43	209.5 Reworked till/Outwash	Flat to hummocky			1	0.5	Sandy Clay/Sandy Silt tr Gravel	no	2
209.5	209.52 Peat bog/outwash	Flat			6	1	Peat/OL	no	0.5
209.52	209.56 Kettle and kame/moraine/till	Flat to hummocky			1.5	1	Silty Sand/Sandy Silt tr Gravel	no	2
209.56	209.59 Peat bog/outwash	Flat			6	1	Peat/OL	no	0.5
209.59	209.64 Kettle and kame/moraine/till	Flat to hummocky			1.5	1	Silty Sand/Sandy Silt tr Gravel	no	2
209.64	209.73 Peat bog/outwash	Flat	GP-282		6	1	Peat/OL	no	0.5
209.73	209.85 Kettle and kame/moraine/till	Flat to hummocky			1.5	1	Silty Sand/Sandy Silt tr Gravel	no	2
209.85	209.86 Peat bog/outwash	Flat			6	1	Peat/OL	no	0.5
209.86	209.91 Kettle and kame/moraine/till	Flat to hummocky			1.5	1	Silty Sand/Sandy Silt tr Gravel	no	2
209.91	209.94 Peat bog/outwash	Flat			6	1	Peat/OL	no	0.5
209.94	209.97 Kettle and kame/moraine/till	Flat to hummocky			1.5	1	Silty Sand/Sandy Silt tr Gravel	no	2
209.97	209.98 Outwash, boggy	Flat to hummocky			3	1	Peat/OL over Silty Sand/Sandy Silt tr Gravel	no	1
209.98	210.01 Kettle and kame/moraine/till	Flat to hummocky			1.5	1	Silty Sand/Sandy Silt tr Gravel	no	2
210.01	210.02 Outwash, boggy	Flat to hummocky			3	1	Peat/OL over Silty Sand/Sandy Silt tr Gravel	no	1
210.02	210.04 Kettle and kame/moraine/till	Flat to hummocky			1.5	1	Silty Sand/Sandy Silt tr Gravel	no	2
210.04	210.23 Reworked till/colluvium	Flat to Rolling			1	0.5	Silty Sand/Sandy Silt tr Gravel	no	2
210.23	210.3 Outwash/reworked till/colluvium,	Flat	GP-283		2	0.5	Peat/OL over Silt w Sand	no	1

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)		Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform			1	0.5	Sandy Silt tr Gravel	no	2	
210.3	210.38	Outwash/reworked till/colluvium	Flat to hummocky		0.5	0.5	Sandy Silt tr Gravel	no	2	
210.38	211.13	Reworked till/colluvium	Flat to Rolling	GP-284	1.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2	
211.13	211.22	Reworked till/colluvium/outwash	Flat to Rolling		0.5	0.5	Silty Sand/Sandy Silt tr Gravel	no	2	
211.22	211.29	Alluvium/reworked moraine/colluvium	Flat to Rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2	
211.29	211.33	Outwash	Flat to Rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	3	
211.33	211.37	Alluvium/outwash	Flat to hummocky		0.25	0.25	Silty Sand tr Gravel	no	2	
211.37	211.4	Outwash	Flat to Rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	3	
211.4	211.49	Alluvium/outwash	Flat to hummocky		0.25	0.25	Silty Sand tr Gravel	no	2	
211.49	211.64	Outwash	Flat to Rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	3	
211.64	211.74	Alluvium/outwash	Flat to hummocky		0.25	0.25	Silty Sand tr Gravel	no	2	
211.74	212.07	Outwash	Flat to Rolling	GP-285	1	0.5	Silty Sand/Sandy Silt tr Gravel	no	2	
212.07	212.1	Alluvium/outwash	Flat to Rolling		1.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2	
212.1	212.17	Peat bog/alluvium	Flat		8	1	Peat/OL	no	0.5	
212.1	212.17	Alluvium/outwash	Flat to Rolling		1.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2	
212.17	212.59	Outwash/reworked till	Flat to Rolling		1	0.5	Silty Sand/Sandy Silt tr Gravel	no	3	
212.59	212.63	Outwash/reworked till	Flat to Rolling		1	0.5	Silty Sand/Sandy Silt tr Gravel	no	3	
212.63	212.67	Outwash, boggy	Flat to Rolling		1	0.5	Peat/OL over Silt	no	1	
212.67	212.74	Outwash, boggy	Flat to Rolling	GP-286	1	0.5	Peat/OL over Silt	no	1	
212.74	212.76	Outwash/reworked till	Flat to Rolling		1	0.5	Silty Sand/Sandy Silt tr Gravel	no	3	
212.76	212.78	Outwash, boggy	Flat to Rolling		1	0.5	Peat/OL over Silt	no	1	
212.78	212.79	Outwash/reworked till	Flat to Rolling		1	0.5	Silty Sand/Sandy Silt tr Gravel	no	3	
212.79	212.8	Outwash, boggy	Flat to Rolling		1	0.5	Peat/OL over Silt	no	1	

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)		Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform			1					
212.8	212.92	Outwash/reworked till	Flat to Rolling			1	0.5	Silty Sand/Sandy Silt tr Gravel	no	3
212.92	212.94	Outwash, boggy	Flat to Rolling			1	0.5	Peat/OL over Silt	no	1
212.94	213	Outwash/reworked till	Flat to Rolling			1	0.5	Silty Sand/Sandy Silt tr Gravel	no	3
213	213.02	Outwash, boggy	Flat to Rolling			1	0.5	Peat/OL over Silt	no	1
213.02	213.1	Outwash/reworked till	Flat to Rolling			1	0.5	Silty Sand/Sandy Silt tr Gravel	no	3
213.1	213.11	Outwash, boggy	Flat to Rolling			1	0.5	Peat/OL over Silt	no	1
213.11	213.11	Reworked till, boggy	Rolling			2	0.5	Peat/OL over Sandy Silt tr Gravel	no	2
213.11	213.35	Reworked till, boggy	Rolling			2	0.5	Peat/OL over Sandy Silt tr Gravel	yes	Frozen
213.35	213.36	Reworked till, boggy	Rolling			2	0.5	Peat/OL over Sandy Silt tr Gravel	no	2
213.36	213.64	Reworked till, boggy	Rolling	GP-287		2	0.5	Peat/OL over Sandy Silt tr Gravel	yes	Frozen
213.64	213.66	Reworked till, boggy	Rolling			2	0.5	Peat/OL over Sandy Silt tr Gravel	no	2
213.66	213.67	Reworked till, boggy	Rolling			2	0.5	Peat/OL over Sandy Silt tr Gravel	yes	Frozen
213.67	213.7	Reworked till, boggy	Rolling			2	0.5	Peat/OL over Sandy Silt tr Gravel	no	2
213.7	214.42	Reworked till, boggy	Rolling			2	0.5	Peat/OL over Sandy Silt tr Gravel	yes	Frozen
214.42	214.43	Reworked till, boggy	Rolling			2	0.5	Peat/OL over Sandy Silt tr Gravel	no	2
214.43	214.52	Outwash fan	Flat to Rolling			1	0.5	Silty Sand/Sandy Silt tr Gravel	no	2
214.52	214.58	Alluvium/colluvium/outwash	Flat			2	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	1
214.58	214.6	Outwash fan	Flat to Rolling			1	0.5	Silty Sand/Sandy Silt tr Gravel	no	2
214.6	214.84	Reworked till/colluvium, boggy	Flat to hummocky	GP-288		2	0.5	Peat/OL over Silty Clay/Silt w Sand	no	1
214.84	214.85	Peat bog	Flat			8	1	Peat/OL	no	0.5
214.85	214.86	Reworked till/colluvium, boggy	Flat to hummocky			2	0.5	Peat/OL over Silty Clay/Silt w Sand	no	1
214.86	214.89	Peat bog	Flat			8	1	Peat/OL	no	0.5
214.89	214.99	Reworked till/colluvium, boggy	Flat to hummocky			2	0.5	Peat/OL over Silty Clay/Silt w Sand	no	1

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description					Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform	(topography)										
214.99	215.02	Peat bog	Flat						8	1	Peat/OL	no	0.5
215.02	215.71	Reworked till/colluvium, boggy	Flat to hummocky	GP-289					2	0.5	Peat/OL over Silty Clay/Silt w Sand	no	1
215.71	215.89	Outwash	Flat to hummocky						1.5	0.5	Peat/OL over Silty Clay/Silt w Sand	no	4
215.89	215.95	Alluvium/outwash	Flat						0.5	0.5	Silty Sand tr Gravel	no	2
215.95	216.28	Outwash	Flat to hummocky	GP-290					1.5	0.5	Peat/OL over Silty Clay/Silt w Sand	no	4
216.28	216.44	Alluvium/outwash	Flat						0.5	0.5	Silty Sand tr Gravel	no	2
216.44	217.78	Alluvium/active channel	Flat	GP-291; GP-292					1	0.5	Poorly Graded Sand w Gravel to Silty Sand/Sandy Silt tr Gravel	no	4
217.78	217.8	Peat bog/alluvium	Flat	GP-293					3	1	Peat/OL over Silt tr Sand	no	1
217.8	217.92	Alluvium	Flat						1	0.5	Poorly Graded Sand w Gravel to Silty Sand/Sandy Silt tr Gravel	no	4
217.92	217.94	Peat bog/alluvium	Flat						3	1	Peat/OL over Silt tr Sand	no	1
217.94	217.94	Peat plateau	Flat						8	1	Ice-rich Peat/OL	no	1
217.94	218.01	Peat plateau	Flat						8	1	Ice-rich Peat/OL	yes	Frozen
218.01	218.01	Peat plateau	Flat						8	1	Ice-rich Peat/OL	no	1
218.01	218.21	Outwash fan, boggy	Flat						2	1	Peat/OL over Sandy Silt	no	0.5
218.21	218.26	Peat bog	Flat						10	1	Peat/OL	no	0
218.26	218.29	Peat bog/outwash fan	Flat						1.5	0.5	Peat/OL over Sandy Silt/Silty Sand	no	1
218.29	218.36	Peat bog	Flat						10	1	Peat/OL	no	0
218.36	218.42	Peat bog - Open water/Outwash fan	Flat						10	1	Peat/OL	no	0
218.42	218.45	Outwash fan, boggy	Flat						1.5	0.5	Peat/OL over Sandy Silt/Silty Sand	no	1
218.45	218.5	Peat bog/outwash fan	Flat						3	1	Peat/OL over Silt	no	0.5
218.5	218.58	Outwash fan, boggy	Flat						1.5	0.5	Peat/OL over Sandy Silt/Silty Sand	no	1
218.58	218.62	Peat bog	Flat						10	1	Peat/Organic Silt	no	0
218.62	218.71	Peat bog/outwash fan	Flat	GP-294					3	0.5	Peat/OL over Sandy Silt/Silty Sand	no	1
218.71	218.79	Peat bog - Open water	Flat						10	1	Peat/Organic Silt	no	0
218.79	218.93	Outwash fan, boggy	Flat						1	0.5	Peat/OL over Sandy Silt/Silty Sand	no	1
218.93	218.96	Peat bog	Flat						10	1	Peat/Organic Silt	no	0
218.96	219.03	Outwash fan, boggy	Flat						1	0.5	Peat/OL over Sandy Silt/Silty Sand	no	1
219.03	219.1	Peat bog	Flat						10	1	Peat/Organic Silt	no	0
219.1	219.11	Outwash fan, boggy	Flat						1	0.5	Sandy Silt/Silty Sand	no	1
219.11	219.12	Alluvium/Outwash fan	Flat						1	0.5	Sandy Silt/Silty Sand	no	1

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)		Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform			1	10	1	Sandy Silt/Silty Sand	no	1
219.12	219.16	Outwash fan, boggy	Flat			1	0.5	Sandy Silt/Silty Sand	no	1
219.16	219.19	Peat bog	Flat			10	1	Peat/Organic Silt	no	0
219.19	219.32	Outwash fan, boggy	Flat			1	0.5	Sandy Silt/Silty Sand	no	1
219.32	219.36	Peat bog - Open water	Flat			10	1	Peat/Organic Silt	no	0
219.36	219.41	Alluvium/Outwash fan	Flat			1	0.5	Sandy Silt/Silty Sand w Gravel	no	1
219.41	219.45	Peat bog	Flat			10	1	Peat/Organic Silt	no	0
219.45	219.51	Outwash fan, boggy	Flat			2	0.5	Peat/OL over Sandy Silt/Silty Sand	no	1
219.51	219.79	Peat bog/outwash fan	Flat	GP-295		14	1.5	Peat/OL over Silty Clay/Silt w Sand	no	0
219.79	219.82	Outwash fan, boggy	Flat			2	0.5	Peat/OL over Sandy Silt/Silty Sand	no	1
219.82	219.83	Peat bog/outwash fan	Flat			14	1.5	Peat/Organic Silt	no	0
219.83	219.84	Outwash fan, boggy	Flat			2	0.5	Peat/OL over Sandy Silt/Silty Sand	no	1
219.84	219.86	Peat bog/outwash fan	Flat			14	1.5	Peat/Organic Silt	no	0
219.86	220	Outwash fan, boggy	Flat			1.5	0.5	Peat/OL over Sandy Silt/Silty Sand	no	2
220	220.08	Peat bog/outwash fan	Flat	GP-296		2	2	Peat/Organic Silt	no	1
220.08	220.62	Outwash fan, boggy	Flat			1.5	0.5	Peat/OL over Sandy Silt/Silty Sand	no	2
220.62	220.65	Alluvium/Outwash fan	Flat			0.5	0.5	Silty Sand tr Gravel	no	2
220.65	221.36	Outwash fan, boggy	Flat			1.5	0.5	Peat/OL over Sandy Silt/Silty Sand	no	2
221.36	221.55	Alluvium/active channel	Flat			1	0.5	Sandy Silt/Silty Sand w Gravel	no	2
221.55	222.27	Outwash fan, boggy	Flat to rolling	GP-297		1.5	0.5	Peat/OL over Sandy Silt/Silty Sand	no	2
222.27	222.46	Peat bog	Flat	GP-298		9.5	1	Peat/OL	no	0.5
222.46	223.64	Outwash fan, boggy	Flat to rolling	GP-299		1.5	0.5	Peat/OL over Sandy Silt/Silty Sand	no	4
223.64	223.68	Alluvium, boggy	Flat			1	0.5	Peat/OL over Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	1
223.68	223.74	Outwash fan, boggy	Flat to rolling			1.5	0.5	Peat/OL over Sandy Silt/Silty Sand	no	4
223.74	223.88	Alluvial fan, boggy	Flat to rolling			2	1	Peat/OL over Silty Sand w Gravel	no	1
223.88	224.64	Colluvium	Rolling to Hilly	GP-300		0.25	0.25	Sandy Silt/Silty Sand	no	>10
224.64	224.7	Colluvium, boggy	Flat to Rolling			2	0.5	Peat/OL over Sandy Silt/Silty Sand	no	2
224.7	224.83	Colluvium	Rolling to Hilly			0.25	0.25	Sandy Silt/Silty Sand	no	>10
224.83	224.84	Peat bog	Flat			11.5	2	Peat/Organic Silt	no	1

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform			0.25	0.25	Sandy Silt/Silty Sand	no	>10
224.84	224.86	Colluvium	Rolling to Hilly		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	1
224.86	224.92	Colluvium/alluvium	Flat		2	0.5	Peat/OL over Sandy Silt/Silty Sand	no	4
224.92	224.99	Outwash fan, boggy	Flat to rolling		10	1	Peat		1
224.99	225.13	Peat bog	Flat		2.5	0.5	Peat over Sandy Silt	no	2
225.13	225.26	Peat bog/outwash fan	Flat to rolling	GP-301	1.5	0.5	Peat/OL over Sandy Silt/Silty Sand	no	4
225.26	225.53	Outwash fan, boggy	Flat to rolling		10	1	Peat	no	1
225.53	225.55	Peat bog	Flat		2.5	0.5	Peat over Sandy Silt	no	2
225.55	225.57	Outwash fan, boggy	Flat		4	2	Peat over Sandy Silt/Silty Sand	no	1
225.57	225.65	Peat bog/alluvium	Flat		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
225.65	225.92	Colluvium/residual soil	Rolling to Hilly		4	2	Peat over Sandy Silt/Silty Sand	no	1
225.92	225.95	Peat bog/colluvium/alluvium	Flat		1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
225.95	226.53	Colluvium/residual soil	Rolling to Hilly		2	1	Peat/OL over Sandy Silt/Silty Sand w Gravel	no	1
226.53	226.61	Colluvium/alluvium, boggy	Flat	GP-302	1	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
226.61	227.33	Colluvium/residual soil	Rolling to Hilly		7.5	2	Peat/OL	no	1
227.33	227.42	Peat bog/colluvium/alluvium	Flat		4	1	Sandy Silt/Silty Sand	no	2
227.42	227.56	Colluvium/residual soil	Flat to rolling		7.5	2	Peat/OL	no	1
227.56	227.65	Peat bog/colluvium/alluvium	Flat	GP-303	0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
227.65	227.76	Colluvium/residual soil	Rolling to Hilly		0.25	0.25	Silty Sand w Gravel to Silty Gravel	no	4
227.76	227.79	Residual soil	Flat to Rolling		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
227.79	228.25	Colluvium/residual soil	Rolling to Hilly		7.5	2	Peat/OL	no	1
228.25	228.34	Peat bog/colluvium/alluvium	Flat		0.5	0.5	Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
228.34	228.78	Colluvium/residual soil	Rolling to Hilly	GP-304	9	2	Peat/OL	no	1
228.78	228.84	Peat bog	Flat		3	1	Peat over Sandy Silt/Silty Sand	no	1
228.84	228.87	Peat bog/colluvium/residual soil	Flat		9	2	Peat/OL	no	1
228.85	228.87	Peat bog	Flat	GP-305					

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)		Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground
Start	End	Landform			5	1				
228.87	228.9	Peat bog/colluvium/residual soil	Flat					Peat over Sandy Silt/Silty Sand	no	1
228.9	229.08	Peat bog	Flat		9	2		Peat/OL	no	1
229.08	229.17	Colluvium/alluvium, boggy	Flat		5	1		Peat over Sandy Silt/Silty Sand	no	1
229.17	229.63	Colluvium/residual soil	Rolling to Hilly		1	0.5		Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
229.63	229.71	Colluvium/alluvium, boggy	Flat to rolling		2	1		Peat over Sandy Silt/Silty Sand	no	2
229.71	230.5	Colluvium/residual soil	Rolling to Hilly	GP-306	1	0.5		Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
230.5	230.62	Colluvium	Rolling		2	1		Peat over Sandy Silt/Silty Sand	no	2
230.62	230.73	Colluvium/alluvium, boggy	Rolling		2	0.5		Peat over Sandy Silt/Silty Sand	no	2
230.73	230.78	Colluvium	Rolling		1	1		Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	2
230.78	230.81	Colluvium/alluvium, boggy	Rolling		2	0.5		Peat over Sandy Silt/Silty Sand	no	2
230.81	230.9	Colluvium, boggy	Flat to rolling		2	1		Peat over Sandy Silt/Silty Sand	no	2
230.9	231.14	Peat bog	Flat	GP-307	11	2		Peat/OL	no	1
231.14	231.23	Alluvium, boggy	Flat		5	1		Peat over Sandy Silt/Silty Sand	no	1
231.23	231.4	Peat bog/alluvium	Flat		11	2		Peat/OL	no	1
231.4	231.94	Alluvium	Flat	GP-308	0.25	0.25		Silty Sand/Sandy Silt w Gravel to Poorly Graded Gravel w Silt	no	2
231.94	232.4	Colluvium/residual soil	Rolling to Hilly	GP-309	1	0.25		Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
232.4	232.44	Colluvium/Alluvium	Flat to rolling		2	1		Peat over Sandy Silt/Silty Sand	no	2
232.44	233.09	Colluvium/residual soil	Rolling to Hilly		1.5	0.5		Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
233.09	233.11	Colluvium/Alluvium	Flat to rolling		2	1		Peat over Sandy Silt/Silty Sand		2
233.11	233.54	Colluvium/residual soil	Rolling to Hilly		1.5	0.5		Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
233.54	233.58	Colluvium/Alluvium	Flat to rolling		2	1		Peat over Sandy Silt/Silty Sand	no	2
233.58	234.23	Colluvium/residual soil	Rolling to Hilly	GP-310	1.5	0.5		Silty Sand/Sandy Silt w Gravel to Silty Gravel Peat over Sandy	no	4
234.23	234.27	Colluvium/alluvium, boggy	Rolling		2	0.5		Peat over Sandy Silt/Silty Sand	no	2
234.27	235.11	Colluvium/residual soil	Rolling to Hilly	GP-311	0.25	0.25		Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
235.11	235.15	Residual soil	Flat to Rolling		0.25	0.25		Silty Sand w Gravel to Silty Gravel	no	4
235.15	235.41	Colluvium/residual soil	Rolling to Hilly		0.25	0.25		Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
235.41	235.45	Colluvium/Alluvium	Rolling		2	1		Peat over Sandy Silt/Silty Sand	no	2
235.45	235.6	Colluvium/residual soil	Rolling to Hilly		0.25	0.25		Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4
235.6	235.62	Colluvium/Alluvium	Rolling		2	1		Peat over Sandy Silt/Silty Sand	no	2

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description					Boring/Geoprobe Locations		Peat/ Muskeg Depth (ft)		Organic Mat Thickness (ft)		Soil in Trench Zone		Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform	(topography)				GP-312			0.25		0.25					
235.62	235.84	Colluvium/residual soil	Rolling to Hilly		GP-312					2		1		Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4	
235.84	235.87	Colluvium/Alluvium	Rolling							0.25		0.25		Peat over Sandy Silt/Silty Sand	no	2	
235.87	237.85	Colluvium/residual soil	Rolling to Hilly	GP-313						7		1		Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4	
237.85	238.04	Peat bog/alluvium	Flat	GP-314						3		1		Peat/OL	no	0.5	
238.04	238.09	Alluvium, boggy	Flat							4		0.25		Peat over Sandy Silt/Silty Sand	no	1	
238.09	238.11	Peat bog/alluvium	Flat											Peat/OL over Silty Sand/Sandy Silt w Gravel to Poorly Graded Gravel w Silt	no	0.5	
238.11	238.45	Colluvium/residual soil	Rolling to Hilly							0.25		0.25		Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4	
238.45	238.51	Peat bog/colluvium/alluvium	Flat							7		1		Peat/OL	no	0.5	
238.51	238.52	Colluvium	Flat to rolling							2		1		Peat over Sandy Silt/Silty Sand	no	2	
238.52	238.54	Peat bog/colluvium/alluvium	Flat							7		1		Peat	no	0.5	
238.54	238.55	Colluvium	Flat to rolling							2		1		Peat over Sandy Silt/Silty Sand	no	2	
238.55	238.6	Peat bog/colluvium/alluvium	Flat							7		1		Peat	no	0.5	
238.6	239.06	Colluvium/residual soil	Rolling to Hilly	GP-315						1		0.5		Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4	
239.06	239.11	Colluvium/alluvium, boggy	Flat							3		1		Peat over Sandy Silt/Silty Sand	no	1	
239.11	239.23	Colluvium/residual soil	Rolling to Hilly							1		0.5		Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4	
239.23	239.25	Colluvium/alluvium, boggy	Flat to rolling							2		1		Peat over Sandy Silt/Silty Sand	no	2	
239.25	239.4	Colluvium/residual soil	Rolling to Hilly							1		0.5		Silty Sand/Sandy Silt w Gravel to Silty Gravel	no	4	
239.4	239.76	Colluvium/alluvium, boggy	Flat to rolling	GP-316						5.5		0.5		Peat/OL	no	5	
239.76	239.91	Alluvium	Flat							1		0.5		Silty Sand/Sandy Silt w Gravel over Poorly Graded Gravel	no	5	
239.91	239.95	Peat bog/alluvium	Flat							7		1		Peat/OL	no	0	
239.95	240	Alluvium	Flat							1		0.5		Silty Sand/Sandy Silt w Gravel over Poorly Graded Gravel	no	5	
240	240.03	Peat bog/alluvium	Flat							7		1		Peat/OL	no	0	
240.03	240.48	Alluvium	Flat							1		0.5		Silty Sand/Sandy Silt w Gravel over Poorly Graded Gravel	no	5	
240.48	240.57	Alluvium/active channel	Flat							0		0		Poorly Graded Gravel	no	0	
240.57	240.82	Alluvium/active channel	Flat							1		0.5		Silty Sand/Sandy Silt w Gravel over Poorly Graded Gravel	no	5	
240.82	241	Alluvium/active channel	Flat							0		0		Poorly Graded Gravel	no	0	
241	241.2	Alluvial terrace	Flat	K-7(GP)						1		0.5		Silty Sand/Sandy Silt w Gravel	no	5	
241.2	241.26	Colluvium/residual soil	Rolling to Hilly							1		0.5		Silty Sand w Gravel to Silty Gravel	no	4	

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground
Start	End	Landform			0.25	0.25	Silty Sand w Gravel to Silty Gravel	no	4
241.26	241.27	Residual soil	Flat to Rolling		1	0.5	Silty Sand w Gravel to Silty Gravel	no	4
241.27	241.47	Colluvium/residual soil	Rolling to Hilly		1.5	0.5	Peat/OL over Silty Sand w Gravel to Silty Gravel	no	2
241.47	241.48	Colluvium/alluvium	Rolling	K-8(GP)	0.5	0.25	Sandy Silt/Silty Sand	no	4
241.48	241.71	Colluvium/residual soil	Rolling to Hilly	K-9(GP)	0.25	0.25	Sandy Silt/Silty Sand	no	4
241.71	241.83	Colluvium/residual soil	Rolling to Hilly		0.5	0.25	Sandy Silt/Silty Sand	no	4
241.83	241.85	Colluvium/alluvium	Flat to Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel	no	2
241.85	241.87	Colluvium	Flat to Rolling		0.25	0.25	Sandy Silt/Silty Sand	no	4
241.87	241.88	Colluvium/alluvium	Flat to Rolling		0.5	0.25	Silty Sand w Gravel to Silty Gravel	no	2
241.88	242.1	Alluvial terrace	Flat to Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel	no	5
242.1	242.12	Alluvial terrace	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel	no	3
242.12	242.14	Alluvium, boggy	Flat	GP-317	7	0.5	Peat/Organic Silt	no	5
242.14	242.32	Alluvial fan	Flat		0.5	0.5	Sandy Silt/Silty Sand	no	7
242.32	242.35	Alluvium, boggy	Flat		7	0.5	Peat/Organic Silt	no	5
242.35	242.42	Alluvial fan	Flat		0.5	0.5	Sandy Silt/Silty Sand	no	7
242.42	242.46	Alluvium, boggy	Flat		7	0.5	Peat/Organic Silt	no	5
242.46	242.69	Alluvial fan	Flat		0.5	0.5	Sandy Silt/Silty Sand	no	7
242.69	242.74	Alluvium, boggy	Flat		7	0.5	Peat/Organic Silt	no	5
242.74	242.88	Alluvium/alluvial terrace	Flat	GP-318.1	1.5	0.5	Peat/OL over Silty Gravel	no	4
242.88	243	Alluvium/active channel	Flat		0.5	0.5	Poorly Graded Sand Gravel to Silty Gravel	no	1
243	243.32	Colluvium	Flat to Rolling	GP-319	0.7	0.25	Silt	no	4
243.32	243.35	Colluvium/alluvium, boggy	Flat to rolling		2	1	Peat over Sandy Silt/Silty Sand	no	2
243.35	243.57	Colluvium	Flat to Rolling		0.7	0.25	Silt	no	4
243.57	243.69	Alluvium/active channel	Flat		1.5	0.5	Sandy Silt/Silty Sand to Silty Gravel	no	2
243.69	243.88	Colluvium	Flat to Rolling		0.7	0.25	Silt	no	4
243.88	243.9	Colluvium/alluvium	Flat to Rolling		0.5	0.5	Sandy Silt/Silty Sand to Silty Gravel	no	3
243.9	244.05	Colluvium	Flat to Rolling	G-319A	1	0.5	Silt	no	4

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)		Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform			1.5	0.5				
244.05	244.68	Alluvium	Flat					Silt over Sandy Silt/Silty Sand to Silty Gravel	no	4
244.68	244.74	Alluvial fan/alluvium, boggy	Flat		2		1	Peat/OL over Silty Sand w Gravel	no	2
244.74	244.77	Alluvial fan	Flat to Rolling		1		0.5	Silt over Sandy Silt/Silty Sand to Silty Gravel	no	4
244.77	244.89	Colluvium, boggy	Flat to Rolling		3		1	Peat/OL over Sandy Silt/Silty Sand to Silty Gravel	no	2
244.89	245.03	Alluvial fan	Flat to Rolling	GP-321	3		1	Peat/OL over Sandy Silt/Silty Sand to Silty Gravel	no	3
245.03	245.25	Colluvium	Rolling		0.5		0.5	Sandy Silt/Silty Sand to Silty Gravel	no	4
245.25	245.26	Colluvium/alluvium, boggy	Flat to rolling		2		1	Peat over Sandy Silt/Silty Sand	no	2
245.26	245.38	Colluvium	Rolling		0.5		0.5	Sandy Silt/Silty Sand to Silty Gravel	no	4
245.38	245.43	Colluvium/alluvium, boggy	Flat to rolling		2		1	Peat over Sandy Silt/Silty Sand	no	2
245.43	245.97	Colluvium/residual soil	Rolling to Hilly	GP-322	1		0.5	Silt to Silty Sand	no	4
245.97	246.01	Residual soil/Wx Bedrock	Rolling		0.25		0.25	Silty Sand w Gravel to Silty Gravel	no	>10
246.01	246.11	Colluvium/residual soil	Rolling to Hilly		1		0.5	Silt to Silty Sand	no	4
246.11	246.14	Colluvium/alluvium	Flat to Rolling		0.5		0.5	Sandy Silt/Silty Sand to Silty Gravel	no	3
246.14	246.32	Colluvium/residual soil	Rolling to Hilly	GP-323	1		0.5	Silt to Silty Sand	no	4
246.32	246.34	Colluvium/alluvium	Flat to Rolling		0.5		0.5	Sandy Silt/Silty Sand to Silty Gravel	no	3
246.34	246.53	Colluvium/residual soil	Rolling to Hilly		1		0.5	Silt to Silty Sand	no	4
246.53	246.8	Residual soil/Wx Bedrock	Rolling		0.25		0.25	Silty Sand w Gravel to Silty Gravel	no	>10
246.8	247.25	Colluvium/residual soil/Wx Bedrock	Rolling to Hilly	TP-1	1		0.5	Sandy Silt/Silty Sand to Silty Gravel over Wx Bedrock	no	>10
247.25	247.31	Residual soil/Wx Bedrock	Rolling	TP-2	0.25		0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
247.31	247.37	Colluvium/residual soil/Wx Bedrock	Rolling to Hilly		1		0.5	Sandy Silt/Silty Sand to Silty Gravel over Wx Bedrock	no	>10
247.37	247.66	Residual soil/Wx Bedrock	Rolling		0.25		0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
247.66	247.99	Colluvium/residual soil	Rolling to Hilly	GP-224	1		0.5	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	4
247.99	248.04	Colluvium/alluvium	Flat to Rolling		1		0.5	Silty Sand w Gravel to Silty Gravel	no	0.5

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
248.04	248.74	Colluvium/residual soil/Wx Bedrock	Hilly	GP-325	0.25	0.25	Sandy Silt/Silty Sand to Silty Gravel/Wx Bedrock	no	2
248.74	248.81	Residual soil/Wx Bedrock	Rolling	TP-3	0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
248.81	248.83	Colluvium/residual soil/Wx Bedrock	Hilly		0.25	0.25	Sandy Silt/Silty Sand to Silty Gravel/Wx Bedrock	no	2
248.83	248.86	Residual soil/Wx Bedrock	Rolling	TP-4	0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
248.86	249.25	Colluvium/residual soil/Wx Bedrock	Hilly		0.25	0.25	Sandy Silt/Silty Sand to Silty Gravel/Wx Bedrock	no	2
249.25	249.29	Colluvium/alluvium, boggy	Flat to Rolling		2	0.5	Peat/OL over Silt Sand w Gravel to Silty Gravel	no	2
249.29	249.7	Colluvium/residual soil/Wx Bedrock	Hilly	GP-326	1	0.5	Sandy Silt/Silty Sand to Silty Gravel/Highly weathered bedrock	no	3
249.7	249.81	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
249.81	249.89	Colluvium/residual soil/Wx Bedrock	Hilly		0.25	0.25	Sandy Silt/Silty Sand to Silty Gravel/Wx Bedrock	no	2
249.89	250.1	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
250.1	250.2	Colluvium/residual soil/Wx Bedrock	Hilly		0.25	0.25	Sandy Silt/Silty Sand to Silty Gravel/Wx Bedrock	no	2
250.2	250.26	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
250.26	250.35	Colluvium/residual soil/Wx Bedrock	Hilly		0.25	0.25	Sandy Silt/Silty Sand to Silty Gravel/Wx Bedrock	no	2
250.35	250.39	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
250.39	250.75	Colluvium/residual soil/Wx Bedrock	Hilly		0.25	0.25	Sandy Silt/Silty Sand to Silty Gravel/Wx Bedrock	no	2
250.75	250.79	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
250.79	251.39	Colluvium/residual soil/Wx Bedrock	Hilly	GP-327	0.1	0.1	Silty Gravel/Wx Bedrock	no	2
251.39	251.44	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
251.44	251.48	Colluvium/residual soil/Wx Bedrock	Hilly		0.1	0.1	Silty Gravel/Wx Bedrock	no	2
251.48	251.5	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
251.5	251.62	Colluvium/residual soil/Wx Bedrock	Hilly	TP-5	0.1	0.1	Silty Gravel/Wx Bedrock	no	2

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
251.62	251.65	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
251.65	251.82	Colluvium/residual soil/Wx Bedrock	Hilly		0.1	0.1	Silty Gravel/Wx Bedrock	no	2
251.82	251.87	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
251.87	251.97	Colluvium/residual soil/Wx Bedrock	Hilly		0.1	0.1	Silty Gravel/Wx Bedrock	no	2
251.97	252.04	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
252.04	253.38	Colluvium/residual soil	Hilly	GP-328	0.1	0.1	Sandy Silt/Silky Sand to Silty Gravel/Wx Bedrock	no	2
253.38	253.5	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
253.5	253.58	Colluvium/residual soil/Wx Bedrock	Hilly		0.1	0.1	Sandy Silt/Silky Sand to Silty Gravel/Wx Bedrock	no	2
253.58	253.65	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
253.65	254.17	Colluvium/residual soil	Hilly	GP-329	0.5	0.1	Sandy Silt/Silky Sand to Silty Gravel/Wx Bedrock	no	2
254.17	254.49	Residual soil/Wx Bedrock	Rolling	TP-7	0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
254.49	254.84	Colluvium/residual soil	Hilly		0.5	0.1	Sandy Silt/Silky Sand to Silty Gravel/Wx Bedrock	no	2
254.84	254.99	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
254.99	256.24	Colluvium/residual soil/Wx Bedrock	Hilly	TP-8; GP-330	0.5	0.1	Sandy Silt/Silky Sand to Silty Gravel/Wx Bedrock	no	2
256.24	256.28	Colluvium/alluvium	Flat to Rolling		2	0.5	Peat/OL over Silt Sand w Gravel to Silty Gravel	no	2
256.28	256.49	Colluvium/Highly weathered bedrock,	Hilly	GP-331	2	0.25	Peat/OL over Sandy Silt/Silky Sand to Silty Gravel/Highly weathered bedrock	no	3
256.49	256.73	Colluvium/residual soil	Hilly		0.5	0.1	Sandy Silt/Silky Sand to Silty Gravel/Wx Bedrock	no	2
256.73	257	Colluvium/residual soil/Wx Bedrock	Hilly	TP-09	0.5	0.1	Sandy Silt/Silky Sand to Silty Gravel/Wx Bedrock	no	2
257	257.23	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
257.23	257.48	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.1	Sandy Silt/Silky Sand to Silty Gravel/Wx Bedrock	no	2
257.48	257.64	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
257.64	258.49	Colluvium/residual soil/Wx Bedrock	Hilly	TP-10; TP-11	0.5	0.1	Sandy Silt/Silty Sand to Silty Gravel/Wx Bedrock	no	2
258.49	258.71	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
258.71	259.1	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.1	Sandy Silt/Silty Sand to Silty Gravel/Wx Bedrock	no	2
259.1	259.13	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
259.13	260.59	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.1	Sandy Silt/Silty Sand to Silty Gravel/Wx Bedrock	no	2
260.59	260.64	Colluvium/alluvium	Flat to Rolling	GP-331A	2	0.5	Peat/OL over Silt Sand w Gravel to Silty Gravel	no	2
260.64	261.35	Colluvium/residual soil/Wx Bedrock	Hilly	GP-332	0.5	0.1	Sandy Silt/Silty Sand to Silty Gravel/Wx Bedrock	no	2
261.35	261.64	Residual soil/Wx Bedrock	Rolling	TP-13	0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
261.64	262.18	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.1	Sandy Silt/Silty Sand to Silty Gravel/Wx Bedrock	no	2
262.18	262.34	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
262.34	262.44	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.1	Sandy Silt/Silty Sand to Silty Gravel/Wx Bedrock	no	2
262.44	262.53	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
262.53	262.68	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.1	Sandy Silt/Silty Sand to Silty Gravel/Wx Bedrock	no	2
262.68	262.83	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
262.83	262.96	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.1	Sandy Silt/Silty Sand to Silty Gravel/Wx Bedrock	no	2
262.96	263.14	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
263.14	263.18	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.1	Sandy Silt/Silty Sand to Silty Gravel/Wx Bedrock	no	2
263.18	263.26	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
263.26	263.42	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.1	Sandy Silt/Silty Sand to Silty Gravel/Wx Bedrock	no	2
263.42	263.75	Colluvium/residual soil	Hilly	GP-332A	0.5	0.1	Sandy Silt/Silty Sand to Silty Gravel/Wx Bedrock	no	2
263.75	263.77	Colluvium/alluvium	Flat to Rolling		1.2	0.5	Silty Sand to Silty Gravel over Clay	no	5
263.77	263.87	Colluvium/residual soil	Hilly	GP-333	0.5	0.1	Sandy Silt/Silty Sand to Silty Gravel/Wx Bedrock	no	2

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform			1.2	0.5	Silty Sand to Silty Gravel over Clay	no	5
263.87	263.89	Colluvium/alluvium	Flat to Rolling		0.5	0.1	Sandy Silt/Silky Sand to Silty Gravel/Wx Bedrock	no	2
263.89	264.95	Colluvium/residual soil/Wx Bedrock	Hilly		0	0	Silty Gravel	no	>10
264.95	265.2	Residual soil	Rolling	GP-334	0.5	0.1	Sandy Silt/Silky Sand to Silty Gravel/Wx Bedrock	no	2
265.2	266.03	Colluvium/residual soil	Hilly		3	0.25	Peat/OL over Silt over Silty Gravel	no	3
266.03	266.08	Colluvium/alluvium, boggy	Flat to Rolling	GP-335	0.5	0.5	Silt over Silty Gravel/Wx Bedrock	no	5
266.08	266.32	Colluvium/residual soil	Hilly		0.5	0.5	Silt	no	>10
266.32	266.44	Colluvium	Hilly	TP-16	0.5	0.5	Silt over Silty Gravel/Wx Bedrock	no	5
266.44	266.67	Colluvium/residual soil	Hilly	TP-17	0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	2
266.67	267.71	Colluvium/residual soil/Wx Bedrock	Hilly	TP-18	0.5	0.1	Sandy Silt/Silky Sand to Silty Gravel/Wx Bedrock	no	>10
267.71	267.9	Residual soil/Wx Bedrock	Rolling		0.5	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	2
267.9	268.08	Colluvium/residual soil/Wx Bedrock	Hilly		0.25	0.1	Sandy Silt/Silky Sand to Silty Gravel/Wx Bedrock	no	>10
268.08	268.21	Residual soil/Wx Bedrock	Rolling		0.5	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	2
268.21	268.47	Colluvium/residual soil/Wx Bedrock	Hilly		0.25	0.1	Sandy Silt/Silky Sand to Silty Gravel/Wx Bedrock	no	>10
268.47	268.56	Residual soil/Wx Bedrock	Rolling		0.5	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	2
268.56	268.78	Colluvium/residual soil/Wx Bedrock	Hilly		0.25	0.1	Sandy Silt/Silky Sand to Silty Gravel/Wx Bedrock	no	>10
268.78	269.03	Residual soil/Wx Bedrock	Rolling	TP-19	0.5	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	2
269.03	269.3	Colluvium/residual soil/Wx Bedrock	Hilly		0.25	0.1	Sandy Silt/Silky Sand to Silty Gravel/Wx Bedrock	no	>10
269.3	269.33	Residual soil/Wx Bedrock	Rolling		0.5	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	2
269.33	269.4	Colluvium/residual soil/Wx Bedrock	Hilly		0.25	0.1	Sandy Silt/Silky Sand to Silty Gravel/Wx Bedrock	no	>10
269.4	269.6	Residual soil/Wx Bedrock	Rolling		0.5	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	2
269.6	269.93	Colluvium/residual soil/Wx Bedrock	Hilly		0.25	0.1	Sandy Silt/Silky Sand to Silty Gravel/Wx Bedrock	no	>10
269.93	269.96	Colluvium/alluvium, boggy	Flat to Rolling		0.5	0.5	Peat/Organic Silt over Sandy Silt/Silky Sand to Silty Gravel	no	2
269.96	271.12	Colluvium/residual soil/Wx Bedrock	Hilly	GP-336; TP-20	0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	5

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
271.12	271.2	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
271.2	271.31	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	5
271.31	271.77	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
271.77	272.04	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	5
272.04	272.15	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
272.15	272.27	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	5
272.27	272.32	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
272.32	272.54	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	5
272.54	272.63	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
272.63	272.74	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	5
272.74	272.8	Colluvium/residual soil	Flat to Rolling	GP-337	0.2	0.2	Silty Sand w Gravel to Silty Gravel	no	>10
272.8	272.97	Colluvium/residual soil/Wx Bedrock	Hilly	TP-21	0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	5
272.97	273.15	Residual soil/Wx Bedrock	Rolling	TP-22	0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
273.15	273.36	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	5
273.36	273.45	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
273.45	273.74	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	5
273.74	273.82	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
273.82	273.88	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	5
273.88	273.96	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
273.96	273.98	Residual Soil	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	5
273.98	274.07	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
274.07	274.86	Colluvium/residual soil/Wx Bedrock	Hilly	TP-23	0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	5

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
274.86	274.91	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
274.91	274.98	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	5
274.98	275.11	Colluvium/residual soil	Hilly		0.2	0.2	Silty Sand w Gravel to Silty Gravel	no	>10
275.11	275.18	Residual soil	Flat to Rolling		0.25	0.25	Silt over Silty Gravel/weathered bedrock	no	>10
275.18	275.37	Colluvium/residual soil	Hilly		0.2	0.2	Silty Sand w Gravel to Silty Gravel	no	>10
275.37	275.41	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
275.41	275.65	Colluvium/residual soil	Hilly		0.2	0.2	Silty Sand w Gravel to Silty Gravel	no	>10
275.65	275.77	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
275.77	275.84	Colluvium/residual soil	Hilly		0.2	0.2	Silty Sand w Gravel to Silty Gravel	no	>10
275.84	276.02	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
276.02	276.21	Residual soil	Flat to Rolling	TP-24	0.25	0.25	Silt over Silty Gravel/weathered bedrock	no	>10
276.21	276.66	Colluvium/residual soil	Hilly	GP-338	0.2	0.2	Silty Sand w Gravel to Silty Gravel	no	>10
276.66	276.75	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	5
276.75	276.77	Residual soil	Flat to Rolling		0.25	0.25	Silt over Silty Gravel/weathered bedrock	no	>10
276.77	276.9	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
276.9	276.93	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	5
276.93	276.99	Residual soil	Flat to Rolling	TP-25	0.25	0.25	Silt over Silty Gravel/weathered bedrock	no	>10
276.99	277.07	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	5
277.07	277.13	Colluvium/residual soil	Hilly		0.2	0.2	Silty Sand w Gravel to Silty Gravel	no	>10
277.13	277.19	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
277.19	277.27	Colluvium/residual soil	Hilly		0.2	0.2	Silty Sand w Gravel to Silty Gravel	no	>10
277.27	277.34	Residual soil	Flat to Rolling		0.25	0.25	Silt over Silty Gravel/weathered bedrock	no	>10

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
277.34	277.36	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
277.36	277.74	Colluvium/residual soil	Hilly		0.2	0.2	Silty Sand w Gravel to Silty Gravel	no	>10
277.74	277.76	Peat/residual soil/Wx Bedrock	Flat to Rolling	GP-339	4.5	1	Peat over Silty Gravel	no	2
277.76	278.02	Colluvium/residual soil	Hilly		1	0.5	Silt over Silty Gravel	no	5
278.02	278.12	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
278.12	278.27	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	5
278.27	278.37	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
278.37	278.44	Residual soil	Flat to Rolling		0.25	0.25	Silt over Silty Gravel/weathered bedrock	no	>10
278.44	278.46	Colluvium/residual soil	Hilly		1	0.5	Silt over Silty Gravel	no	5
278.46	278.54	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	5
278.54	278.95	Colluvium/residual soil	Hilly	GP-340	1	0.5	Silt over Silty Gravel	no	5
278.95	279.18	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	5
279.18	279.27	Residual soil/Wx Bedrock	Rolling	TP-26	0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
279.27	279.64	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	5
279.64	279.74	Colluvium/residual soil	Hilly	GP-340A	1	0.5	Silt over Silty Gravel	no	5
279.74	279.82	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	5
279.82	279.91	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
279.91	280.19	Colluvium/residual soil/Wx Bedrock	Hilly	GP-341	1.3	0.5	Silt over Silty Gravel/weathered bedrock	no	5
280.19	280.31	Residual soil	Flat to Rolling		0.25	0.25	Silt over Silty Gravel/weathered bedrock	no	>10
280.31	280.4	Colluvium/residual soil	Hilly		1	0.5	Silt over Silty Gravel	no	5
280.4	280.48	Residual soil	Flat to Rolling		0.25	0.25	Silt over Silty Gravel/weathered bedrock	no	>10
280.48	281.17	Colluvium/residual soil	Hilly		1	0.5	Silt over Silty Gravel	no	5
281.17	281.36	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
281.36	281.54	Colluvium/residual soil/Wx Bedrock	Hilly		1.3	0.5	Silt over Silty Gravel/weathered bedrock	no	5
281.54	282.02	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
282.02	282.09	Residual soil	Flat to Rolling		0.25	0.25	Silt over Silty Gravel/weathered bedrock	no	>10
282.09	282.19	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
282.19	283.36	Colluvium/residual soil	Hilly		1	0.5	Silt over Silty Gravel	no	5
283.36	283.45	Alluvium/active channel	Flat	TP-28; TP-29; EG-1; EG-2	0.25	0.25	Silty Sand over Poorly Graded Gravel	no	1
283.45	283.51	Alluvium, boggy	Flat		0.25	0.25	Poorly Graded Sand w Silt to Silty Sand	no	6
283.51	283.52	Abandoned channel, infilled	Flat	EG-3	8	2	Peat/Organic Silt	no	2
283.52	283.53	Alluvium, boggy	Flat		2	0.25	Peat/OL over Sandy Silt/Silty Sand	no	6
283.53	283.66	Alluvium, boggy	Flat		1	0.25	Peat/OL over Sandy Silt/Silty Sand	no	6
283.66	283.68	Alluvium, boggy	Flat	EG-4	2	0.25	Peat/OL over Sandy Silt/Silty Sand	no	6
283.68	283.71	Abandoned channel, infilled	Flat		8	2	Peat/Organic Silt	no	2
283.71	283.73	Alluvium, boggy	Flat		2	0.25	Peat/OL over Sandy Silt/Silty Sand	no	6
283.73	283.87	Alluvium, boggy	Flat		1	0.25	Peat/OL over Sandy Silt/Silty Sand	yes	6
283.87	283.87	Alluvium, boggy	Flat		2	0.25	Peat/OL over Sandy Silt/Silty Sand	no	6
283.87	283.89	Abandoned channel, infilled	Flat		10.5	0.25	Peat/Organic Silt	no	2
283.89	283.94	Alluvium	Flat		10.5	0.25	Peat/Organic Silt	no	2
283.94	283.94	Peat plateau	Flat	GP-342	8	1	Peat/Organic Silt	no	7.5
283.94	284.07	Peat plateau	Flat		8	1	Peat/Organic Silt	yes	7.5
284.07	284.08	Peat plateau	Flat	TP-30	8	1	Peat/Organic Silt	no	7.5
284.08	284.09	Alluvium	Flat		10.5	0.25	Peat/Organic Silt	no	2
284.09	284.11	Peat plateau	Flat		8	1	Peat/Organic Silt	no	7.5
284.11	284.14	Peat plateau	Flat		8	1	Peat/Organic Silt	yes	7.5
284.14	284.15	Peat plateau	Flat		8	1	Peat/Organic Silt	no	7.5
284.15	284.17	Alluvium	Flat		10.5	0.25	Peat/Organic Silt	no	2
284.17	284.19	Colluvium/residual soil	Hilly		1	0.25	Sandy Silt/Silty Sand over Silty Gravel/weathered bedrock	no	3
284.19	284.22	Colluvium/Alluvium	Flat to Rolling		1	0.5	Silt over Silty Gravel/weathered bedrock	no	3
284.22	284.7	Colluvium/residual soil	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	3
284.7	284.87	Colluvium/residual soil/Wx Bedrock	Hilly	GP-343	1.3	0.5	Silt over Silty Gravel/weathered bedrock	no	5

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
284.87	284.92	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
284.92	284.97	Colluvium/residual soil/Wx Bedrock	Hilly		1.3	0.5	Silt over Silty Gravel/weathered bedrock	no	5
284.97	285.39	Residual soil	Rolling		0.5	0.5	Sandy Silt/Silky Sand over Silty Gravel/weathered bedrock	no	6
285.39	285.83	Colluvium/residual soil	Hilly	TP-31	0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	3
285.83	285.87	Colluvium/alluvium	Flat to Rolling	GP-344	1.5	0.25	Sandy Silt/Silky Sand	no	4
285.87	286.42	Colluvium/residual soil	Hilly	GP-344A	1	0.5	Silt over Silty Gravel/weathered bedrock	no	3
286.42	286.53	Colluvium/residual soil/Wx Bedrock	Hilly	GP-345	1.3	0.5	Silt over Silty Gravel/weathered bedrock	no	5
286.53	286.96	Colluvium/residual soil	Hilly		1	0.5	Silt over Silty Gravel/weathered bedrock	no	3
286.96	286.99	Colluvium/alluvium	Flat to Rolling		1.5	0.25	Sandy Silt/Silky Sand	no	4
286.99	287.51	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
287.51	287.94	Colluvium/residual soil	Hilly	TP-32	1	0.5	Silt over Silty Gravel/weathered bedrock	no	3
287.94	288.05	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
288.05	288.49	Colluvium/residual soil/Wx Bedrock	Hilly	TP-33	0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
288.49	288.53	Colluvium/alluvium	Flat to Rolling	TP-345A	1.5	0.25	Sandy Silt/Silky Sand	no	4
288.53	288.91	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
288.91	288.99	Residual soil/Wx Bedrock	Rolling	TP-34	0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
288.99	289.43	Colluvium/residual soil/Wx Bedrock	Hilly	GP-346	0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
289.43	289.44	Colluvium/alluvium	Flat to Rolling		1.5	0.25	Sandy Silt/Silky Sand	no	4
289.44	289.57	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
289.57	289.78	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
289.78	290.17	Colluvium/residual soil	Hilly	GP-347	1	0.5	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	3
290.17	290.25	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform			1	0.5			
290.25	290.66	Colluvium/residual soil	Hilly		0.2	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	3
290.66	290.81	Alluvial terrace/alluvium	Flat		0.33	0.33	Silty Sand to Poorly Graded Sand w Silt and Gravel	no	7
290.81	291.19	Alluvium/active channel	Flat	G-2; G-3	0.4	0.4	Silty Sand to Poorly Graded Sand w Silt and Gravel	no	5
291.19	291.2	Alluvial terrace/alluvium	Flat		0.4	0.4	Sandy Silt/Silky Sand	no	4
291.2	291.45	Alluvial terrace/alluvium	Flat	G-4	0.4	0.4	Sandy Silt/Silky Sand	yes	Frozen
291.45	291.54	Alluvial terrace/alluvium	Flat		0.4	0.4	Sandy Silt/Silky Sand	no	4
291.54	291.56	Alluvial terrace/alluvium	Flat		0.4	0.4	Sandy Silt/Silky Sand	yes	Frozen
291.56	291.6	Alluvial terrace/alluvium	Flat		0.4	0.4	Sandy Silt/Silky Sand	no	4
291.6	292.48	Colluvium/residual soil	Hilly	GP-347A	0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
292.48	292.89	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
292.89	293.56	Colluvium/residual soil	Hilly	GP-349	0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
293.56	293.99	Colluvium/residual soil/Wx Bedrock	Hilly	TP-35	0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
293.99	294.11	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
294.11	294.4	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
294.4	294.57	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
294.57	294.81	Colluvium/residual soil	Hilly	GP-350	0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
294.81	295	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
295	295.18	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
295.18	295.6	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
295.6	295.63	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
295.63	295.8	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
295.8	295.93	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
295.93	296.89	Residual soil/Wx Bedrock	Rolling	TP-37	0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
296.89	297.48	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
297.48	297.96	Colluvium/residual soil	Hilly		0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
297.96	298.41	Alluvial terrace/floodplain	Flat	GP-351; NFG-1	0.5	0.5	Silty Sand to Poorly Graded Sand w Silt and Gravel	no	2.5
298.41	299.01	Colluvium/residual soil	Hilly	NFG-2; NFG-3	0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
299.01	299.26	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
299.26	299.34	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
299.34	299.47	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
299.47	299.49	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
299.49	299.56	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
299.56	299.59	Residual soil/Wx Bedrock	Rolling	GP-353	0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
299.59	299.65	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
299.65	299.75	Colluvium/residual soil	Hilly		0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
299.75	299.86	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
299.86	300.2	Colluvium/residual soil	Hilly		0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
300.2	300.29	Residual soil/Wx Bedrock	Rolling	GP-354	0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
300.29	300.35	Colluvium/residual soil	Hilly		0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
300.35	300.38	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
300.38	300.52	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
300.52	300.62	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
300.62	300.76	Colluvium/residual soil	Hilly	TP-38	0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
300.76	300.83	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
300.83	302.64	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
302.64	302.68	Colluvium/residual soil	Hilly		0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
302.68	302.75	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
302.75	302.9	Colluvium/residual soil	Hilly		0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
302.9	303.1	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
303.1	303.21	Residual soil	Rolling		0.5	0.5	Sandy Silt/Silky Sand over Silty Gravel/weathered bedrock	no	6
303.21	303.38	Residual soil/Wx Bedrock	Rolling	TP-40	0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
303.38	303.41	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
303.41	303.45	Residual soil	Rolling		0.5	0.5	Sandy Silt/Silky Sand over Silty Gravel/weathered bedrock	no	6
303.45	303.77	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
303.77	303.92	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
303.92	303.99	Residual soil	Rolling		0.5	0.5	Sandy Silt/Silky Sand over Silty Gravel/weathered bedrock	no	6
303.99	304.07	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
304.07	304.14	Residual soil	Rolling		0.5	0.5	Sandy Silt/Silky Sand over Silty Gravel/weathered bedrock	no	6
304.14	304.21	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
304.21	304.38	Residual soil	Rolling		0.5	0.5	Sandy Silt/Silky Sand over Silty Gravel/weathered bedrock	no	6
304.38	304.4	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
304.4	304.5	Residual soil	Rolling		0.5	0.5	Sandy Silt/Silky Sand over Silty Gravel/weathered bedrock	no	6
304.5	304.6	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
304.6	304.72	Colluvium/residual soil	Hilly	GP-355	0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
304.72	304.81	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
304.81	304.85	Residual soil	Rolling		0.5	0.5	Sandy Silt/Silky Sand over Silty Gravel/weathered bedrock	no	6
304.85	304.86	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
304.86	304.89	Residual soil	Rolling		0.5	0.5	Sandy Silt/Silky Sand over Silty Gravel/weathered bedrock	no	6

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)		Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform			0.5	0.25	0.5	Silt over Silty Gravel/weathered bedrock	no	4
304.89	305.03	Colluvium/residual soil/Wx Bedrock	Hilly					Silt over Silty Gravel/weathered bedrock	no	>10
305.03	305.14	Residual soil/Wx Bedrock	Rolling		0.25		0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
305.14	305.29	Colluvium/residual soil	Rolling		0.5		0.5	Sandy Silt/Silty Sand over Silty Gravel/weathered bedrock	no	6
305.29	305.37	Residual soil/Wx Bedrock	Rolling		0.25		0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
305.37	305.38	Colluvium/residual soil/Wx Bedrock	Hilly		0.5		0.5	Silt over Silty Gravel/weathered bedrock	no	4
305.38	305.4	Colluvium/residual soil	Hilly		0.75		0.25	Silt over Silty Gravel/weathered bedrock	no	4
305.4	305.42	Colluvium/residual soil/Wx Bedrock	Hilly		0.5		0.5	Silt over Silty Gravel/weathered bedrock	no	4
305.42	305.44	Colluvium/residual soil	Hilly		0.75		0.25	Silt over Silty Gravel/weathered bedrock	no	4
305.44	305.51	Residual soil/Wx Bedrock	Rolling		0.25		0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
305.51	305.84	Colluvium/residual soil	Hilly	GP-356	0.75		0.25	Silt over Silty Gravel/weathered bedrock	no	4
305.84	305.86	Colluvium/residual soil/Wx Bedrock	Hilly		0.5		0.5	Silt over Silty Gravel/weathered bedrock	no	4
305.86	305.96	Residual soil/Wx Bedrock	Rolling		0.25		0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
305.96	305.99	Colluvium/residual soil/Wx Bedrock	Hilly		0.5		0.5	Silt over Silty Gravel/weathered bedrock	no	4
305.99	306.04	Residual soil	Rolling		0.5		0.5	Sandy Silt/Silty Sand over Silty Gravel/weathered bedrock	no	6
306.04	306.12	Colluvium/residual soil/Wx Bedrock	Hilly		0.5		0.5	Silt over Silty Gravel/weathered bedrock	no	4
306.12	306.3	Colluvium/residual soil	Hilly		0.75		0.25	Silt over Silty Gravel/weathered bedrock	no	4
306.3	306.49	Residual soil	Rolling	TP-42	0.5		0.5	Sandy Silt/Silty Sand over Silty Gravel/weathered bedrock	no	6
306.49	306.61	Residual soil/Wx Bedrock	Rolling		0.25		0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
306.61	306.74	Colluvium/residual soil/Wx Bedrock	Hilly		0.5		0.5	Silt over Silty Gravel/weathered bedrock	no	4
306.74	306.8	Residual soil/Wx Bedrock	Rolling		0.25		0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
306.8	306.82	Colluvium/residual soil/Wx Bedrock	Hilly		0.5		0.5	Silt over Silty Gravel/weathered bedrock	no	4
306.82	306.97	Colluvium/residual soil	Hilly		0.75		0.25	Silt over Silty Gravel/weathered bedrock	no	4

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
306.97	307.01	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
307.01	307.18	Colluvium/residual soil	Hilly		0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
307.18	307.28	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
307.28	307.3	Residual soil	Rolling		0.5	0.5	Sandy Silt/Silky Sand over Silty Gravel/weathered bedrock	no	6
307.3	307.39	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
307.39	307.4	Residual soil	Rolling		0.5	0.5	Sandy Silt/Silky Sand over Silty Gravel/weathered bedrock	no	6
307.4	307.49	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
307.49	307.56	Residual soil	Rolling		0.5	0.5	Sandy Silt/Silky Sand over Silty Gravel/weathered bedrock	no	6
307.56	307.66	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
307.66	308.02	Colluvium/residual soil	Hilly	GP-357; TP-43	0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
308.02	308.48	Colluvium/residual soil/Wx Bedrock	Hilly	TP-44	0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
308.48	308.5	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
308.5	308.58	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
308.58	308.61	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
308.61	308.77	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
308.77	308.81	Residual soil	Rolling		0.5	0.5	Sandy Silt/Silky Sand over Silty Gravel/weathered bedrock	no	6
308.81	308.89	Colluvium/residual soil	Hilly		0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
308.89	308.96	Residual soil	Rolling		0.5	0.5	Sandy Silt/Silky Sand over Silty Gravel/weathered bedrock	no	6
308.96	309.16	Colluvium/residual soil	Hilly		0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
309.16	309.34	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
309.34	309.45	Colluvium/residual soil	Hilly		0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
309.45	309.54	Colluvium/residual soil/Wx Bedrock	Hilly	TP-45	0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
309.54	309.83	Colluvium/residual soil	Hilly	TP-46; GP-358	0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
309.83	309.94	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
309.94	310.05	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
310.05	310.19	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
310.19	310.22	Residual soil	Rolling		0.5	0.5	Sandy Silt/Silty Sand over Silty Gravel/weathered bedrock	no	6
310.22	310.27	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
310.27	310.38	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
310.38	310.45	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
310.45	310.65	Colluvium/residual soil	Hilly		0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
310.65	310.68	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
310.68	310.87	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
310.87	310.98	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
310.98	311.02	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
311.02	311.07	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
311.07	311.19	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
311.19	311.21	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
311.21	311.32	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
311.32	311.47	Colluvium/residual soil/Wx Bedrock	Hilly	TP-47	0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
311.47	311.59	Residual soil/Wx Bedrock	Rolling	TP-48	0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
311.59	312.1	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
312.1	312.26	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
312.26	312.31	Residual soil	Rolling		0.5	0.5	Sandy Silt/Silty Sand over Silty Gravel/weathered bedrock	no	6

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)	Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground-
Start	End	Landform							
312.31	312.34	Colluvium/residual soil	Hilly		0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
312.34	312.53	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
312.53	312.71	Colluvium/residual soil	Hilly		0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
312.71	312.77	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
312.77	312.83	Colluvium/residual soil	Hilly		0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
312.83	312.88	Residual soil	Rolling		0.5	0.5	Sandy Silt/Silty Sand over Silty Gravel/weathered bedrock	no	6
312.88	312.9	Colluvium/residual soil	Hilly		0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
312.9	312.97	Residual soil	Rolling		0.5	0.5	Sandy Silt/Silty Sand over Silty Gravel/weathered bedrock	no	6
312.97	313.03	Colluvium/residual soil	Hilly		0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
313.03	313.07	Residual soil	Rolling		0.5	0.5	Sandy Silt/Silty Sand over Silty Gravel/weathered bedrock	no	6
313.07	313.08	Colluvium/residual soil	Hilly		0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
313.08	313.12	Residual soil	Rolling		0.5	0.5	Sandy Silt/Silty Sand over Silty Gravel/weathered bedrock	no	6
313.12	313.18	Colluvium/residual soil	Hilly		0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
313.18	313.24	Residual soil	Rolling	TP-49	0.5	0.5	Sandy Silt/Silty Sand over Silty Gravel/weathered bedrock	no	6
313.24	313.26	Colluvium/residual soil	Hilly		0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
313.26	313.29	Residual soil	Rolling		0.5	0.5	Sandy Silt/Silty Sand over Silty Gravel/weathered bedrock	no	6
313.29	313.45	Colluvium/residual soil	Hilly		0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
313.45	313.51	Colluvium/residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
313.51	313.95	Colluvium/residual soil	Hilly		0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
313.95	314.29	Residual soil/Wx Bedrock	Hilly		0.5	0.5	Silt over Silty Gravel/weathered bedrock	no	4
314.29	314.35	Colluvium/residual soil/Wx Bedrock	Hilly		0.75	0.25	Silt over Silty Gravel/weathered bedrock	no	4
314.35	314.49	Residual soil/Wx Bedrock	Rolling		0.25	0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10

Pipeline Soil and Permafrost Data

130627 Milepost			Terrain Description (topography)	Boring/Geoprobe Locations	Peat/ Muskeg Depth (ft)		Organic Mat Thickness (ft)	Soil in Trench Zone	Perma-frost (yes/no)	Average Depth to Ground
Start	End	Landform			Depth (ft)					
314.49	314.9	Colluvium/residual soil	Hilly	GP-359	0.75		0.25	Silt over Silty Gravel/weathered bedrock	no	4
314.9	314.98	Residual soil/Wx Bedrock	Rolling	TP-50	0.25		0.25	Silty Sand w Gravel to Silty Gravel/Wx Bedrock	no	>10
314.98	315.19	Colluvium/residual soil	Hilly		0.75		0.25	Silt over Silty Gravel/weathered bedrock	no	4

Sources: BGC (2013a, 2013c, 2013j), CH2MHill (2011b), Polar Geoscience (2010, 2011), SRK (2013b)

This page intentionally left blank.